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MOUNTAINEERING IN ALASKA.

BY

ISRAEL C. RUSSELL.

An approximate estimate of the difficulties to be overcome in climbing various mountains can be had by comparing the height and distance of their summits, above and beyond the highest point at which a camp-fire is available without transporting fuel.

When camp-fires can be had not only is there no necessity for carrying alcohol or oil, together with the necessary apparatus for burning it, but one can exist with less covering, especially when sleeping, and also requires less food than when camping above "timber-line." We should also note the advantages gained from the feeling of security and comfort that a blazing fire brings to the weary and perhaps storm-bound explorer. It is generally true, also, that climbing is comparatively easy on slopes where plants, especially trees, can grow; thus making it even more evident that the main difficulties awaiting a mountaineer are concentrated above the upper limit of tree-growth, or the timber-line.

If we measure the difficulties of climbing the mountains of America by the standard suggested above certain interesting facts appear. On Chimborazo, the highest point where a camp-fire is available is at an altitude of about 15,000 feet. The height of the mountain, according to Whymper, is 20,545 feet, thus leaving approximately 6,000 feet as a measure of the actual mountaineering required in order to reach the highest summit in the New World.

The great volcanoes of Mexico are a little over 18,000 feet high, and the timber-line may be taken at 14,000 feet. In the Sierra Nevada the highest summit, Mt. Whitney, has an elevation of

14,522 feet, and trees cease to thrive at about 11,000 feet, leaving but three or four thousand feet of the ascent in which a camp-fire cannot be had without transporting fuel. Mt. Shasta and Mt. Tacoma each have elevations of about 14,500, and rise some seven thousand feet above the encircling forests. In the Rocky Mountains the upper limit of vegetation is somewhat greater than on the peaks just named, and besides the massiveness of the uplifts and the general absence of sharp crests and spine-like peaks makes them comparatively easy of ascent.

In all of the instances referred to above, which include the highest mountains in North America south of the Alaskan region, the distance to be traversed between the highest camp-fire and the objective point is at the most only a few miles.

The usual plan for ascending lofty mountains is to establish a camp at the highest accessible point at which a fire can be had without transporting fuel, and then to "hold on" until the weather is favorable, and with but slight impedimenta make a dash for the top. If the first attempt fails, a retreat can be made to the timber-line camp, where safety is assured, and another attack can be undertaken when the conditions are again favorable. In the case of most of the mountains referred to in the last paragraph, the timber-line can be reached by pack animals,—indeed, in many instances mules may be taken to the actual summit—thus making it practicable to secure a base of operation with a comparatively small expenditure of time and energy.

As the timber-line decreases in elevation from the tropics toward either pole, the difficulties to be expected in climbing various peaks of about the same height are indicated in a rough way by their latitude. The lower limit of perpetual snow in the tropics is about 18,000 feet, and it descends lower and lower toward both the north and south. The mountains in high latitudes are frequently sheathed from summit to base in snow-fields and glaciers, thus vastly increasing the obstacles that one has to overcome in order to reach their tops.

The highest mountains in North America are in Alaska and the adjacent part of Canada, where the timber-line is low and glaciers descend to sea-level. In the neighborhood of Mt. Logan, 19,500 feet high, and so far as known the highest summit on this continent, and of Mt. St. Elias, with an altitude of 18,023 feet, the timber-line is only 1,500 or 2,000 feet above the sea. Not infrequently the highest available camp-fire in that region is considerably below the upper limit of timber growth. To reach the summit of

Mt. Logan, or Mt. St. Elias, one is obliged to travel not less than fifty and probably fully seventy-five miles in each instance, after leaving the cheerful blaze of the last camp-fire. When one considers the amount of fuel, provisions, clothing, blankets, tents, etc., required for so long a trip in the snow, he will begin to appreciate the difficulties and hardships of such an undertaking.

With this general statement of the comparative difficulties of mountaineering in different latitudes, I wish to invite the reader's attention to some features of the second of two attempts made by the writer to reach the summit of Mt. St. Elias.*

On June 6, 1892, I reached Icy Bay, the nearest point on the coast to Mt. St. Elias, on the U. S. Revenue steamer *Bear*, in command of Captain M. A. Healy. Icy Bay is a misnomer, as there is no indentation of the coast at that locality. A landing had to be made through the surf on an open beach, the character of which was unknown. The transfer of my party and of our stores from the vessel to the shore was made in small boats, in command of the Lieutenants of the *Bear*. This difficult task was carried out with both bravery and skill, but, unfortunately, four of the boats capsized in the surf, and from one of them, containing seven men, only one man reached shore alive. The provisions and instruments carried in the boats that capsized were washed ashore and picked up on the beach. The boats that did not meet with serious trouble took in more or less water, so that nearly all of our supplies ran the risk of being water-soaked. Owing to careful packing, however, and to the fact that the greater part of our rations were secured in tin cans, securely soldered, but little damage was done.

Our first camp was in a beautiful flower-decked meadow, beneath young spruce trees. After "caching" such articles as were not needed for the inland journey, on a raised platform where they would be out of the reach of bears, we began the line of our march toward Mt. St. Elias.

My companions were five in number, one of the original party, W. C. Moore, having been drowned. Three of the men were with me on a similar expedition the year previous, and had acquired some experience in mountaineering; the others were familiar with frontier life and well qualified for the hardships before them. We had no

* "An Expedition to Mt. St. Elias, Alaska," in *National Geographic Magazine*, (Washington, D. C.), Vol. 3, 1891, pp. 55-200.

"Second Expedition to Mt. St. Elias, Alaska," in *Thirteenth Annual Report of the Director of the U. S. Geological Survey*, 1891-2, pp. 1-91. Washington, D. C., 1894.

pack animals, and all of our "outfit" had to be carried on our backs, or *packed*, to use the technical language of the frontier.

For about two miles northward from the first camp, our route was across a smooth sand-plain, on which travelling was easy, except that a number of swift, muddy streams of ice-cold water had to be forded. One of these streams, too deep and swift to wade, was crossed by means of a rude foot-bridge made of logs carried with much labor from the adjacent forest. The bridge was swept away a few hours after being built, thus compelling two of the camp hands and myself to swim the icy water, upon returning to the base camp a few days later.

At the northern margin of the sand-plain traversed during the first march, we reached the southern border of the great ice-sheet, known as Malaspina glacier, which intervenes between Mt. St. Elias and the Pacific. The margin of the glacier where we first reached it is about 500 feet high and densely forest-covered. The forest grows not only about the margin of the glacier, but extends up over its steep border and covers the extremely rough moraines resting on stagnant ice for four or five miles inland. The vegetation is exceedingly dense. Spruce trees three feet in diameter fringe the outer margin and between their sturdy trunks there is a tangled growth of alders, aspens, ferns and other plants growing in tropical luxuriance.

Through this almost impassable jungle we were obliged to cut a trail with axes and hunting knives, before our packs could be advanced. Reaching the inner border of the forest-covered moraine, we had before us a vast expanse of barren moraine broken by thousands of crevasses, and diversified by pits and hollows holding lakes. Between the lakes rose huge pyramids and spires of ice of the most rugged description, each one sheathed with stones and dirt, which furnished only an insecure foothold. Our route lay across this desolate, lifeless area for a distance of ten or twelve miles to the clear ice beyond. This portion of our journey was exceedingly fatiguing. A single day's march over the loose, angular stones made such sad havoc with our shoes, that repairs were required almost every night.

In making a direct march from the coast to Mt. St. Elias, on the line chosen, the last place where a camp-fire can be had is at the inner margin of the forest-covered moraine, at an elevation of less than 1,000 feet above the sea and about seven miles inland. The only available route to the summit of Mt. St. Elias is by way of the Agassiz glacier, which curves about the eastern base of the mountain

and receives a tributary ice stream, known as Newton glacier, from its northern side. As my object was especially to study the glaciers and the geology of the region explored, we did not take the most direct route, but for this and other reasons, made a detour to the west and visited the Chaix hills which rise through the Malaspina glacier and attain an elevation of 3,000 feet above its surface. The southern base of this rugged island in the ice, is forested and affords excellent camping places at an elevation of between 1,500 and 2,000 feet. We there established our highest "fire camp" and making a reassortment of instruments and supplies, took with us to the higher regions only what seemed strictly essential. Our highest camp-fire was at least 16,000 feet lower than the peak we wished to climb and by the only available route, without considering minor deflections, not less than twenty-five miles from it. Every rod of this distance was over glaciers and snow-fields. During much of this toilsome march we threaded our way through a net-work of crevasses, so that the actual distance traversed was much nearer fifty than twenty-five miles.



CROSSING MALASPINA GLACIER. A MOMENT'S REST.

At the Chaix hills I encamped alone for five days, while my companions were advancing the packs across the barren moraines of the Malaspina glacier to the clear ice in its central portion, where a temporary cache was made. My camp was by the side of a broad game-trail on which fresh tracks of huge bears were abun-

dant. During my stay I explored the neighboring region, and with much labor cut spruce trees and built a sled with which to continue the journey across the clear ice of the Malaspina glacier and up the Agassiz glacier. The task of constructing a sled was difficult, as trees with the required curvature for runners had to be cut on steep slopes, and in one instance on the side of a precipice where a slip would have been fatal. After securing the necessary sticks, they had to be hewed and sawed into shape with tools that were inadequate for the purpose. With the aid of a few nails and some copper wire, a sled was finally made that was strong, if not beautiful, and afterward did good service. When the men rejoined me, we cut a large spruce tree having a curved trunk and hewed out a toboggan. The sled and toboggan were then carried across the rough moraine bordering the Chaix hills on the east, to the cache that had been made on the clear ice, and the march northward renewed. Owing to the roughness of the ice at the start, the toboggan became so frayed and torn that it was soon rendered useless and had to be abandoned. By making double trips with the sled, the supplies were at length advanced to the foot of the lowest ice-fall in the Newton glacier. The sled was then left, and is now probably being carried slowly southward by the flowing ice. It will perhaps be found during the years to come, on the border of the Malaspina glacier to the east of the Chaix hills.

After leaving our comfortable and exceedingly picturesque camp at the Chaix hills, we were enabled at our first camping place to pitch our tents on a thin moraine, composed of fragments of black slate, on the margin of the clear ice of the Malaspina glacier. At the next advance we found a luxuriant carpet of mosses and flowers, on which to spread our blankets, at the extreme western end of the Samovar hills. Above the Samovar hills, however, every camp was on the open snow-fields, at a sufficient distance from neighboring precipices to be safe from avalanches.

During our sojourn in the snow we used tents of light, cotton cloth, seven feet square, supported by a ridge rope, the ends of which were usually made fast to alpenstocks. At the corners, the tent was held down by packs, cans of provisions, and, in fact, anything that could be extemporized for the purpose. At times hunting knives were used for tent pins. On two occasions when it was necessary for me to pitch a tent without assistance, having only one alpenstock to use for a tent pole, I piled up snow so as to form a slender column three or four feet high to support the tent at the rear. Water poured over the column soon froze and held the snow

firmly. The base of the tent was then pressed into the snow and water poured on and allowed to freeze. My tent was thus "frozen up," as one might say, instead of being "pinned down."

Our cooking was done over a double-wick, coal-oil stove, provided with a tin reservoir. Oil was carried in one-gallon cans, as hand packs. Our provisions consisted principally of "flap-jacks," made of wheat flour and corn meal, and fried meat, either bacon, corn beef or pemican, and coffee. But little tea was used. Some of our camps were near shallow pools on the snow, from which water was obtained; at other times we were enabled to draw water from crevasses by means of a bucket attached to a line; usually, however, we had to melt snow or ice in order to obtain the water necessary for drinking and cooking. As to washing, a handful of snow rubbed over the face and hands was our only means of bathing during the weeks we were above where a camp-fire was available. Of clothing, we had a good supply of woollen garments, including thick flannel shirts and heavy, knit socks. Each man had also one double woollen blanket in which to sleep at night. During several nights, which will be long remembered on account of their discomforts, I slept on the névé of the Newton glacier, with two companions under one blanket, supplemented by oil coats and a top and bottom layer of canvas.

No alcoholic liquors of any kind were taken; although a small supply in case of accident would have been advisable. Several of the party indulged in the use of tobacco. In our lonely camps in the snow, when fierce storms threatened to carry away our frail shelter, a grateful pipe brought rest and contentment that even the most ardent reformer would have been pleased to see. Many were the tales of frontier life and adventure told under the influence of that mild sedative. I would like to enlarge upon some of these stories, if enlargement were possible, and to preserve them in a permanent form, but space will not allow of such a digression.

Fur garments and fur sleeping bags would have been unavailable even if we had taken them, for the reason that we were frequently exposed to rain and had to sleep many times on snow saturated with water. Fur clothing is unquestionably the best that can be had when the temperature is below freezing; but nothing is more uncomfortable when water-soaked. In addition to our woollen garments, each man was provided with an oil-coat and a "sou'wester." Our blankets were rolled in canvas to protect them when travelling and serve as a substratum together with oil-coats when sleeping.

The equipment described above will no doubt seem inadequate

to many who are not accustomed to "roughing it"; but thus provided, we lived for five weeks on the broad snow-fields without a single camp-fire to warm our benumbed fingers or to dry our clothing. Even when protected from the rain by water-proof coats, our garments, while carrying heavy packs, became wet with perspiration and rendered exceedingly uncomfortable. In spite of long exposure and reduced rations, every one of the party enjoyed the best of health and returned to civilization stronger and more rugged than at the beginning of the season.

Packs, weighing about fifty pounds, were carried by each man, by means of "pack straps" made of several strands of hemp-line, known as "cod-line," and intended for use in cod fishing. These lines were chosen instead of leather straps, not only because of their lightness, but for the reason that in cases of necessity the "straps" could be quickly undone and used as life-lines. We also had ropes for fastening ourselves together in the usual manner when travelling over crevassed snow. Each man was provided with a hickory alpenstock, seven feet long and one and one-fourth inches in diameter at the centre, tapering to one inch in diameter at the ends. These were furnished at one extremity with a steel spike about three inches long, with a hook near the ferrule, after the manner of boat-hooks; the other extremity was armed with a chisel with a cutting edge two and one-half inches broad. The chisels enabled one to cut steps on descending slopes, and to clear away the loose snow on the opposite side of a crevass across which it was necessary to spring. In these and many other ways our strong alpenstocks were found to be of great service. Instead of the conventional ice-axe, we carried smaller implements of the same general pattern, with handles 16 inches long. These ice-hatchets, as they may be called, were tied to our packs when travelling, and only carried in the hand when actually required for cutting steps. Colored glasses were indispensable, and were worn when we travelled during the day. Our shoes were of the strongest make available, but were constantly in need of repairs. Material for cobbling was provided, but the demand for leather for patches became so great that instrument cases had to be sacrificed for that purpose. While crossing the rough moraines near the coast, our shoes were shod with broad headed nails of soft iron, supplemented with spikes and sharp-headed screws when we reached the clear ice. At greater elevations, where the snow was soft, the long spikes used by lumbermen when walking on floating logs, were added to what remained of the armament previously employed.

Owing to the high latitude in which Mt. St. Elias is situated, the summer days are long. During the greater part of our stay above timber-line, it was light enough when the sky was clear, even at midnight, for one to read ordinary print or to write notes. This enabled us to make night marches and avoid the intense glare of the sunlight reflected from the snow. At night, the temperature usually fell below freezing, and the snow, softened during the day so as to be quite impassable, became sufficiently hardened to be traversed with comparative ease. Another advantage of travelling by night was that we could sleep during the day when the air was warm. The night marches were frequently enjoyable, owing to the exquisite beauty of the white-robed mountains when illuminated by the soft twilight. At night, the sun declined only about eight degrees below the northern horizon, and the glories of the after-glow were frequently prolonged until they merged with the radiance of the succeeding morning.

In ascending the Newton glacier, our route lay through a region of magnificent ice-falls, some of them a thousand feet high, and broken into a great variety of spires and pinnacles. In some of these difficult places we were obliged to thread our way through partially-filled crevasses, and to cut steps up nearly vertical escarpments. Dashes up these difficult and dangerous places were made at night or in the early morning when the snow was hard, and the danger from avalanches at a minimum. Between the ice-falls, the grade of the glacier is gentle, but the ice deeply crevassed, thus necessitating many wide departures from the direct route. When crevasses blocked the way we were sometimes obliged to make a detour of half a mile or more in order to advance a few feet. Many narrow snow bridges had to be crossed, where a misstep would have caused a tumble into a seemingly bottomless abyss. These crystal crypts of the vast cathedral among the spires of which we were exploring, were exceedingly beautiful, and called forth many exclamations of wonder and admiration. Even when we had to crawl across some frail arch of snow, for fear it would give way if our weight should be concentrated on a small area, the exquisite beauty and the wonderful coloring of the blue depth below would cause us to pause and admire the delicate tracery of the fairy-like chambers beneath. Although dangers unfamiliar to those who have not lived in high mountains were numerous on the treacherous *névés*, yet the novelty and constantly varying wonders of the region more than repaid us for the toil and hardship encountered.

The greatest hindrances to our advance were the mists and

clouds that frequently enveloped the mountains and concealed every line of the sublime picture as with an impenetrable veil. With the mists came rain and snow. At such times there was but one thing to do, and that was to wait. When a way ahead free from avalanches could not be chosen, we pitched our tents in the snow and waited as patiently as possible for the veil to be lifted. During these long delays, additional supplies were advanced from lower camps, as opportunity served; but when the line of footprints made during the upward journey became faint and finally disappeared beneath the fine light snow that fell, hour after hour and day after day, with weary monotony, our line of communication was broken. Energy and enthusiasm were then unavailing, and patience became the ruling virtue.

Our highest camp was at an elevation of about 8,000 feet in the vast amphitheatre in which the Newton glacier has its principal source, and was held for twelve days. During the greater part of the time we were enveloped in clouds, and several times our tents became deeply buried beneath the snow. The site of the camp was hastily chosen during the prevalence of a dense mist which rendered it unsafe to continue advancing, as the roar of avalanches from neighboring precipices told that a too near approach to the veiled peaks would be disastrous.

During the twelve days that we lay in our highest camp there was but one opportunity to advance. Starting at two o'clock on the morning of July 24, we climbed the precipitous and deeply crevassed snow-slope, about four thousand feet high, leading from the amphitheatre where our camp was placed, to the divide between Mt. St. Elias and Mt. Newton. Much of the way had been swept by avalanches, and was so steep that steps had to be cut for perhaps half of the distance. From the divide, about 13,000 feet in elevation, an inspiring view was obtained of the vast snow-covered mountains to the north, a region never before seen by man. The day was unusually fine, and the air so clear that Mt. Fairweather, 150 miles distant, stood out so sharply against the dark sky that it seemed scarcely fifty miles away. Thousands of rugged peaks, rising from a general névé region, with an altitude of about 8,000 feet, filled all of the northern and western sky, but Mt. Newton, standing near at hand, shut out the view to the north-east and concealed Mt. Logan. That majestic peak, worthy to bear the name of Canada's famous geologist, came into view later, as we ascended the northern slope of the crowning pyramid of Mt. St. Elias.

The sunlight reflected from the shining snow-fields around us was of blinding intensity. We wore deeply colored glasses to protect our eyes, but our faces, although tanned and weather-beaten by much exposure, were blistered by the intensity of the heat. On account of the rarity and dryness of the atmosphere, however, the temperature in the shade was below freezing. A thermometer thrust an inch or two deep in the snow fell at once to 16° of the Fahrenheit scale. While my companions, Stamy and McCarty, dug a hole in the side of a steep snow-bank in which to place a small lamp for the purpose of melting snow so that we could quench our great thirst, I studied the far-reaching panorama spread out before me and sought to learn some of the secrets of the wild region where so many great glaciers have their birth.

After resting and taking a light lunch, we continued on up the steep slope leading to the summit of Mt. St. Elias, having to cut steps nearly all the way. As we rose above the divide, the view became wider, and at last, when higher than the summit of Mt. Newton, nothing obscured the vast panorama except the peak we were ascending. About four o'clock in the afternoon we reached an elevation of over 14,500 feet, and could have gained the summit had not prudence dictated that we should turn back and advance our camp to the divide between Mt. St. Elias and Newton before making a push for the top. We had already climbed 6,500 feet, since leaving our tent, on slopes so steep that steps had to be cut much of the way. No mountaineer could do more and return to camp without an interval of rest. A change in the aspect of the sky told that a storm was gathering, and as night was approaching, it became imperative that we should regain our camp before darkness rendered it impossible to retrace our steps through the maze of crevasses below the divide. We reached our tent twenty hours after leaving it, and none too soon, as the shadows in the bottom of the amphitheatre were so dense during the last mile of the descent that we could not follow the trail made in the morning, and had to find our camp more by instinct than anything else. Much fatigued, we slept until late the next morning. Renewed storm rendered it impossible to advance our camp to the divide between Mt. St. Elias and Mt. Newton, as we had hoped to do. At last; weary with waiting, we abandoned the hope of reaching the summit and reluctantly retreated toward the base camp at Icy Bay. The descent was made through clouds and rain. The snow was soft and treacherous and travelling exceedingly fatiguing. These discomforts were no greater than we had experienced many

times before, but the feeling that we had failed in our undertaking, took away the buoyancy that encouraged us during the ascent and made us more sensitive to our surroundings. After three long weary marches we regained our old camp-ground at the western end of the Samovar hills, and for the first time in five weeks spread our blankets on a mat of vegetation and inhaled the delicious odors of flowers.

After reaching Icy Bay we made a weary march of sixty miles or more, eastward, along the coast to the head of Yakutat Bay. When near the shore we were obliged to wade many swift, icy streams that threatened to sweep us into the sea, and when seeking to avoid this danger by going farther inland, we encountered rough moraines or had to force our way through tangled vegetation. This portion of our journey was made in the teeth of a cold, north-east storm, and was even more trying to our endurance than our sojourn above the snow-line. At last, after about three months of toil and hardship, during which we had not seen a single human being outside our own party, we reached the Mission at Yakutat and obtained letters from home.

THE INDIANS OF BRITISH COLUMBIA.

BY

DR. FRANZ BOAS.

During the last seven years my studies of the North American Indians have led me frequently to the coast of British Columbia, into the recesses of its deep fjords and to the storm-beaten shores of its islands. In the following remarks I will describe some of the results of my studies and some experiences, but I will dwell particularly upon the interesting customs which it was my good fortune to observe in a cruise along the coast last winter.

Many are the tourists who nowadays in commodious steamers pass up and down the rugged coast of British Columbia on their tour to Alaska and many a time have the beautiful fjords, the snow-covered mountains the foot of which is clad in evergreen forests been described in vivid colors. But a different impression is left on the mind of him who in a small canoe passes through the intricate channels of the coast, tossed by tempestuous squalls which blow down the sides of the mountains and struggling against the rapid tides which in places rush like torrents through narrow openings. The overwhelming solitude and stillness of the shores, the monotony of the dark pines and cedars, of the channels and of the roaring cascades beget a longing for the sight of human work, of human habitation, that swallows the admiration of the magnificent scenery. Gladly welcomes the traveller the smoke which is seen to arise in the far distance, at a place where the steep coast line is interrupted by a small flat and which indicates the presence of an Indian village. While thus travelling from place to place with my Indian friends I had ample opportunity to become familiar with their life, their customs and their ideas.

Before describing the life of the Indians I may be permitted briefly to summarize what we know about their general appearance and their relationships to each other and to the rest of the American race. The casual visitor is first of all struck by the remarkable similarity of the natives of the North Pacific Coast with the races of Eastern Asia. Even after a long acquaintance with the people single individuals are found whom one might almost mistake for Asiatics. It happened to me even last winter that I met a broad-faced, light-complexioned person, with brownish, almost black hair,

attired in a sailor's suit, whom I was unable to classify for quite a while. Finally he happened to look sideways, which brought into prominence a very strongly Mongoloid eye—the peculiar eye, that we always see in Chinamen—and this settled in my mind that he must belong to Asia. In fact he proved to be a Japanese. This formation of the eye which is more strongly marked in the Mongol is sometimes the only means of detecting the difference between individuals belonging to the two races. Taken as a whole, however, the face of the Indian is much heavier built, his hair is not as coarse as that of Chinamen or Japanese. Young persons have the Chinese eye often just as strongly developed as the Chinese themselves. We may say that the people, particularly those of the northern parts of the territory, occupy a position intermediate between the Indians of the plains and the East Asiatic races.

But the tribes of this coast are by no means homogeneous. A few of them take quite an exceptional position. In most cases the noses and faces of these Indians are wide, but low. Among the southern tribes there are some, whose faces are, to the contrary, wide and very high, the noses being at the same time narrow and almost Roman in form. It is remarkable that as soon as we cross the mountains of southern British Columbia the characteristic Indian face becomes very prominent.

I must not omit to mention one peculiarity. We are accustomed to consider the Indians as possessed of black, straight hair, and as of a reddish complexion. The hair of the Indians of the North Pacific Coast is very frequently slightly wavy and brownish, his complexion is very light. There are even a few tribes among whom red hair and almost white complexions occur.

The most striking peculiarity exhibited by these tribes is the effect of the custom of artificially deforming their heads by closely bandaging and pressing the head of the infant as long as it is in the cradle. By this means growth of the head sideways is stopped and it grows backward and upward. The forehead becomes at the same time flat and receding.

It is very curious that in the region of which we are speaking a great many different methods of deforming the head are in use. Further to the south, instead of lengthening the head, the Indians flatten it. They bring a strong pressure to bear upon the forehead.

The custom of deforming the head is very widely spread, and was still more so in olden times. In America it is still practiced on the coast of British Columbia and as far south as Oregon. The tribes of Kansas flatten their heads. Formerly all the people of

Colorado, of the lower Mississippi, of the West Indies, and the Peruvians deformed the heads of their children.

Outside of America the custom is found in several islands of the Pacific Ocean and, what seems hardly credible, in southern France. The last-named occurrence seems to be the only survival of a custom which in antiquity was practiced from the Caucasus through Hungary to southern France. It has often been asked what the meaning of this practice may have been. We must undoubtedly consider it simply as a fashion which grew up as other fashions do and as having no more nor less meaning than the deformation of the feet by the Chinese, of the teeth by the Africans, or of the waist by our own ladies.

If in regard to their physique these Indians are by no means uniform, they are still less so in regard to their languages. Seven radically distinct languages are spoken by them in this small area, and some of them are split up in subdivisions to a marvellous extent. When saying radically distinct languages, I mean that they differ as much in structure and in vocabulary as English and Turkish, which as we know are not related at all; while the subdivisions may differ as much as English and Greek, both of which belong to the Aryan stock. There is only one thing which these languages have in common, namely, their extreme harshness, superabundance of consonants and scarcity of vowels, combined with an extreme energy of pronunciation. The languages are in structure similar to other American languages. In this respect no affinity to Asiatic peoples is found. They fall naturally into a number of groups which show very interesting geographical relations. The languages of southern British Columbia resemble in structure somewhat those spoken on a belt which stretches along the Northern States and Southern Canada right across the continent. The languages of the north are, on the other hand, somewhat analogous to the languages spoken in the whole extreme northwestern portion of America; but each of these two groups is wholly unlike the other.

I will not enter into these somewhat difficult relations any further, but will describe that portion of my travels which seems to touch upon some of the most interesting problems of Indian history.

On several of my trips I had visited a tribe who bore the proud name of the Kwakiutl, the "smoke of the world." This name, I might say, almost characterizes the Indian. The "smoke of the world," that means that their hospitality is such that the smoke of their fire at which the food is being roasted fills the whole world, and that the fire is being kept burning all the time. When I first

visited the tribe my arrival gave rise to much speculation and distrust, which led to my being invited to attend a council at which the subject was to be discussed. At that time the minds of the Indians were much stirred by efforts of the Canadian Government to put a stop to certain dances and ceremonials, and every stranger was suspected as a Government agent with sinister designs. In the council I was addressed as follows by the chief of the village:

"We want to know whether you have come to stop our dances and feasts, as the missionaries and agents who live among our neighbors try to do. We do not want to have anybody here who will interfere with our customs. We were told that a man-of-war would come if we should continue to do as our grandfathers and great-grandfathers have done. But we do not mind such words. Is this the white man's land? We are told it is the Queen's land; but no! it is mine! Where was the Queen when our God came down from heaven? Where was the Queen when our God gave the land to my grandfather and told him, 'This will be thine'? My father owned the land and was a mighty chief; now it is mine. And when your man-of-war comes let him destroy our houses. Do you see yon woods? Do you see yon trees? We shall cut them down and build new houses and live as our fathers did. We will dance when our laws command us to dance, we will feast when our hearts desire to feast. Do we ask the white man, 'Do as the Indian does'? No, we do not. Why then do you ask us, 'Do as the white man does'? It is a strict law that bids us dance. It is a strict law that bids us distribute our property among our friends and neighbors. It is a good law. Let the white man observe his law; we shall observe ours. And now, if you are come to forbid us to dance, begone; if not, you will be welcome to us."

My words in reply to this speech seem to have been taken very kindly, for since that time I have never been made more at home than among this tribe.

How much more friendly was my reception last year. On one of my later visits I had received an Indian name, Heiltsakuls, "The one who says the right thing." I was coming down the coast in a small steamer which, as it approached the village in the middle of the night, blew its whistle until a canoe came alongside. I was recognized at once and paddled ashore, and many were the welcomes that were offered to me that night.

I had arrived at a most opportune season for my studies. The whole tribe and a great many friends from neighboring villages were assembled to celebrate the great religious ceremonial which

takes place about midwinter. There was excitement in all the houses. Here preparations were made for feasts, there the approaching ceremonies were earnestly discussed. Others were busy collecting all their property in order to pay off debts, which is considered one of the most important transactions in the life of these Indians.

On the morning after my arrival I invited at once the whole tribe—about 250 souls in all—to a feast. It was a feast *to them*, although the provender which I furnished consisted of nothing but hard tack and molasses. Before the biscuits were distributed I had to make the formal speech depreciating my small feast and asking my guests to be happy and to eat to their hearts' desire. In return I was told that no feast like mine had ever been given and that I was a great chief. The figurative speech of the Kwakiutl Indians has it about like this: "You are the loaded canoe that has anchored in front of our village and is unloading its riches; you are the precipice of a mountain from which wealth is rolling down upon all the people of the whole world; you are the pillar supporting our world." And all this for a treat of hard tack and molasses. But the gross flattery of this speech must not be taken too seriously, as it is simply a stereotype formula used for expressing the thanks for a feast.

Custom requires that before the feast four songs are sung. The young men—the singers—sit in two or three rows in the rear of the house. Planks are laid in front of each row, and they carry short sticks to beat time with. As soon as the time for opening the song begins the singing master jumps upon a box and gives the signal to begin. At once the deafening noise of the beating of the boards begins, and then the chorus commences the song. I regret that I cannot give an example of this peculiar music. It has often been said that Indian music is no more than a meaningless and senseless howling, but to him who knows to listen to the music so imperfectly rendered by untrained voices the weird strains soon gain a curious attraction. As the musical phrases repeat themselves and appear in new and unexpected combinations, the art of the native composer becomes clearer and clearer. As new rhythmical forms are introduced into the song we recognize beauties which were at first obscured by their imperfect rendition. The words of the songs also prove a deep poetical feeling, although this becomes not so apparent in feast songs, which are made distasteful to the refined ear by an incredible amount of brag on the one hand and of flattery on the other.

Let me give a few examples of this poetry in translation. Here is a feast song:

1. I am a great chief, famous all over the world. I am the highest chief among all the tribes. Chiefs are my servants. Chiefs are my messengers. Chiefs are to me like my ragged, torn blankets. Do not irritate me, else I will destroy your property and your lives. I am like to a mountain whom nobody can scale, towering over the chiefs of all mankind. I have destroyed a whole tribe. When I approach, a heavily loaded war canoe, chiefs wish to hide under ground. I destroyed the tribes at the north end of our world.

2. Do not let my gaze behold you. Do not annoy me, of whom you hear even at the edge of our world, else I shall tie your hands and hang you. You shall know my greatness: I am as powerful as one whole tribe; yea, I am as powerful as four tribes. I am the one who stands on top of the highest mountain. My face shines like red copper. I am the great mountain. I am the pillar of the world. I am the one who stems the tide; chiefs are my servants.

But I should convey a too unfavorable impression of my Indian friends if I did not also render to you one of their love songs which reveals a deep and passionate feeling:

1. Like pain of a burn is my love of you, my dear.
2. Like pain racking my whole body is my love of you, my dear.
3. Like sickness is my love of you, my dear.
4. Like a wound hurts me my love of you, my dear.
5. Like fire burns me my love of you, my dear.
6. I am thinking of the words that you spoke to me.
7. I am thinking of the love you bear me.
8. I am trembling before the power of your love.
9. Oh, what pain do you cause me.
10. Oh, where is my true love going, my dear?
11. Oh, my true love is going to leave me.
12. I feel faint on account of the words my true love spoke to me.
13. Good-bye, my true love, my dear.

In the course of the feast many speeches are made which refer to the transactions of the daily life of the people. In order to explain this I must say a few words in regard to the curious economic system that has arisen among the tribes. The coin and the unit of value of the Indians is the single blanket, formerly a fur blanket, but now a cheap woollen blanket. All their possessions are invested in blankets, and in these a system of credit has developed. The total number of blankets in a village may be a few hundred, while the accumulated wealth would amount to many thousands. As soon as a person receives blankets in payment for services or for sold objects he loans them out to those in need of blankets. They must be repaid with a high rate of interest, which ranges according to time and circumstances at from 25% to 300%. Thus the cautious and careful are able to build

up large fortunes in comparatively a short time, although they may not possess more than a few blankets at a time. At a certain time they may have to repay a considerable debt to some one individual. This is always done publicly, and is made the occasion of much ceremony. Often at the same time blankets are presented to other members of the tribe. These *must* accept the present, but by accepting it become debtors to double the amount received. Thus the seeming squandering of property is actually no more and no less than a profitable investment. Nevertheless a distribution of property brings honor and increased influence. I believe this is the most complex economic system that has developed anywhere among the native races of America, particularly in so far as it is based to a large extent upon credit.

It is clear that such a system, once established, must influence the social life of the people very considerably, and that is what we actually observe. The investment of property and its return with appropriate ceremonies is the one dominating thought of these people. As the frequent distributions of property are considered to raise the rank of the giver, they are also made occasions to bring forward the feats of the ancestors from whom the rank and position of the Indian is derived. Thus it happens that the family legends are related at such occasions with much pride and with great ceremony. In conclusion of the ceremony a young relative of the person who distributes the property is made to dance. These events mostly took place during the daytime, while the evenings were reserved for feasts. The second night of my stay a feast took place, which was very interesting in many respects. Everything had been going on very quietly and sedately as described before. The four songs had been sung and the host was delivering his speech when, all of a sudden, he was interrupted by an unearthly cry which came from among the people who were standing behind him. A youth rushed forward into the middle of the house in a state of greatest excitement. He fell down as though in a fit and suddenly he was seen to fly upward to the roof, to the right and to the left through the house, and now he had disappeared.

For a short time dead silence reigned. Then the voices of birds were heard on the roof and the youth's clothing, all covered with blood, fell down into the house. The father took it up, and amid the greatest excitement, exclaimed, "Do you know what this means? The spirits have taken away my son. He is being taken to their house at the north end of the world. They are going to

instil their desires into him and he will return a cannibal." The ensuing excitement was indescribable. There was a general screaming, speechifying and beating of boards. The medicine men danced around the fire, shaking with every limb of their bodies. The fire was extinguished and the people almost fled to their houses.

I must now explain what this disappearance of the youth meant. The origin of this custom, according to the folk-lore of the Kwakiutl, is derived from a number of spirits living in the woods. Among these one called Bakbakwalanukseewae—that means the cannibal at the north end of the world—is the most important. The following legend illustrates the ideas of the Indians in regard to this spirit:

Once upon a time there lived a man who had four sons. His name was Noakowa, the wise one. One day the sons were going to hunt mountain goat. Before they started Noakowa said, "When you go hunting you will reach a house from which a reddish smoke is rising; do not enter there; it is the house of the cannibal spirit Bakbakwalanukseewae." The sons promised to obey and started on their expedition.

After a while they saw a house, from the roof of which black smoke was rising. It was the abode of the black bear. They proceeded, and after a short while they found another house from which white smoke was rising. They entered and saw that it was the house of the mountain goat. Having rested they proceeded, and at last they saw a house from which a reddish smoke was rising. They stopped and spoke unto each other, "Shall we pass by this house? Let us enter and see who lives in it." This they did, and found a woman who was rocking her baby. Opposite her sat a boy with an enormously large head. The four brothers stepped up to the fire and sat down on a box. In doing so the eldest one hurt his leg, and blood dripped from it. The boy with the large head nudged his mother and whispered, "O, mother, how I should like to lick that blood!" When his mother told him not to do it he scratched his head and soon began, notwithstanding her command, to wipe off the blood and to lick it from his finger. Then the eldest brother nudged the youngest one and said, "O, I think father was right. I wish we had followed his advice." Meanwhile the boy licked the blood more and more eagerly.

The eldest of the brothers mustered courage. He took an arrow from his quiver and shot it through the door of the house, then he told his youngest brother to go and fetch the arrow; he

obeyed, but as soon as he had left the house he ran away towards his home. After a little while the eldest of the brothers took another arrow from his quiver and shot it through the door of the house. He told the next brother to fetch it, and he also made his escape. When he had shot a third arrow the third brother escaped. Then the boy with the large head began to cry, for he was afraid of the eldest of the brothers. The woman asked, "Where have your brothers gone? I hope they will be back soon." "O, yes," replied the young man, "they have only gone to fetch my arrows." So saying, he took another arrow from his quiver and shot it through the doorway of the house; then he went himself to fetch it. As soon as he had left the house he followed his brothers. After a short while, when the youths did not return, the old hag knew that her guests had escaped. She stepped to the door and cried, "Bakbakwalanukseewae, come! oh, come! I have allowed your good dinner to run away." Her husband, although far away, heard her cries and quickly approached. The four brothers heard him approaching and ran as fast as their legs would carry them. The eldest was carrying a whetstone, a comb and some fish grease, which he used for anointing his hair. When the cannibal had almost reached them, he threw the whetstone over his shoulder, and lo! it was transformed into a steep mountain which compelled the pursuer to go round about it. But soon he came again near the fugitives. Now the young man poured out over his shoulder the hair oil, which was transformed into a large lake. While the pursuer had to go around it the young men gained a good start on him. When he had almost reached them for the third time, the eldest of the brothers threw over his shoulder his comb, which was transformed into a thicket of young trees, which their pursuer was unable to penetrate. Before he could pass around it the young men had reached their father's house. They had hardly entered and bolted the door when the cannibal arrived and demanded entrance.

Noakowa, the father of the brothers, killed a dog, carved it and collected its blood in a dish. Then he called the cannibal to come to a knothole in the wall of the house, gave him the dish and said: "This is the blood of my sons. Take it and carry it home to your wife. I invite you to a feast to-night, and be sure to come with your wife and your children. You may feast upon my sons." The cannibal promised to come.

As soon as he had gone, Noakowa and his sons dug a deep pit near the fireplace and built a large fire. They put stones into it,

which they threw into the pit as soon as they were red hot. They concealed the pit by spreading a skin in front of it. These preparations were hardly finished when the cannibal arrived in his canoe, accompanied by his wife and his three children. One of them he left in the canoe as a watchman, while the others went into the house.

Then Noakowa made them sit down in the seat of honor, near the fire, their backs turned towards the skin which concealed the pit. When the cannibal had settled down comfortably, and the meat was boiling in the large wooden kettle, he said: "Noakowa, you know how everything happened in the beginning of the world. Tell me what you know." Noakowa replied: "I shall tell you this," and beating time with his *baton* he sang:

"What shall I tell you of olden times, my grandchildren? Yon cloud was lying on the mountains."

When he had sung this spell twice the cannibal and his family felt drowsy, and when he had sung it four times they slept sound and fast. Now Noakowa removed the skin and plunged his guests headlong into the pit. Twice the cannibal cried *ham, ham!* then he was dead. When all had perished, Noakowa tied a rope around their bodies and pulled them out of the pit. The old cannibal's body he cut into pieces, which he threw in all directions, singing: "In course of time you will pursue man." They were transformed into mosquitoes. The boy who had remained in the canoe made his escape and lives since that time in the woods.

It is this spirit who initiates the new cannibal. After his disappearance he is supposed to stay with the spirit for a long time. When the time of his stay is nearly up the father of the novice invites all the people to his house, in order to try to bring back the lost man. I can describe only a few of the more striking features of this elaborate ceremonial, which is based on the theory that certain songs or performances will attract the novice from his distant abode and induce him to come back. As it is not known what performance may attract him, all conceivable ceremonies are shown during that night in order to try which will be effective.

There are a considerable number of dancing societies, as we might call them, each of which owns a certain ceremonial, and all of them come into activity in the endeavor to bring back the novice. Therefore this event is one of the most interesting performances to witness.

Among the secret societies there are a number whose duty it is to see that no mistakes from the prescribed ceremonial are made by

the dancers or by the audience. These are mainly the cannibals, who are initiated by the cannibal spirit, the bear dancers, who always wear bear's claws, and the madman dancers, who are armed with clubs and lances. They sit on an elevated seat in the rear of the house, and as soon as a mistake is made in a rhythm, tune or in a dance, they attack the unfortunate one who was guilty of this crime. The cannibals bite pieces of flesh out of his arm, the bears scratch him, and the madman dancers stab him. In very serious cases he may even be killed.

When the people are assembled, one dancer after another enters the house. The ceremony begins in the evening and often lasts until daylight of the following morning. I cannot describe all the masks which appear representing the protectors of the various societies, such as the wolf, the bear, the eagle, and other animals. I will at once proceed to describe those dances or ceremonies which are likely to bring back the novice and which possess a greater interest. Among these are the so-called war dances. Two messengers who are stationed at the door announce the arrival of the dancer by shaking their rattles. At once the singers begin to beat the planks. He enters dressed with an apron of hemlock branches, his trunk is naked except a wide neck-ring of hemlock branches, and he wears a crown of the same material. He carries in his hands a formidable club, the point of which is set with long spikes. He dances around the fire and suddenly drives the spikes of his club into his head and then into his neck. Blood is seen to flow down and he feigns to collapse. Then the medicine men are called up and after some incantations leave him hale and well. This performance is accomplished in the following way: The head-ring and neck-ring are wound around pipes made of the hollow stems of kelp, which are filled with blood. As soon as the spike enters the kelp the blood flows down. Another war dance is managed in a similar manner. The dancer is pierced by a lance—which actually slides back into its handle and which apparently produces a wound at the opposite side of the body.

In still another dance the performer appears naked. Deep gashes are cut in his back through which ropes made of cedar bark are passed. He carries a knife with which he is stabbing his head. Thus he is led about the fire. Then the ropes are passed over the beams of the house and he is pulled up. When he is thus dangling in the air, the madman dancers gather right under the place where he is hanging and hold their lances upright, so that, if the flesh should give way, the war dancer would fall on the lance points and

be killed. This cruel performance is gone through, with an astonishing amount of bravery. While the man is hanging from the beams he sings and stabs his head so that the blood flows freely.

When even *this* dance does not bring back the novice, the ghost dance is performed. A person, who, at a former time, was initiated by the ghost, enters the house dancing and singing. By his song he conjures the ghost. Suddenly the earth is seen to open. A skeleton rises from under ground, takes hold of the dancer and drags him down. His friends rush up to him and try to hold him, but in vain. One person, who succeeded in grasping his shoulders, is dragged under ground as far as his elbows, and is then seen to be dragged by his departing friend all through the house, ploughing up the floor with his arms. It is very curious to see him going through the house in this manner. It really looks as though he was being dragged, while in reality he pulls himself along a rope which is buried beneath the floor of the house and is covered with loose dirt. Finally, he lets go his hold. His friend has departed to the under world. Then the voice of the chief of the ghosts is heard to chant right from the middle of the fire. In order to produce this effect, speaking tubes made of kelp are laid from a hidden corner of the house under ground to the middle of the fireplace. After a while, the ground opens again and the dancer reappears from under ground. When he has finished his dance, the people begin a song in his honor. As soon as in this song the word "ghost" is pronounced, a terrible noise is heard on the roof. Four times it moves around on top of the house, then the planks are thrown aside and the novice is seen, pale and haggard. He stretches his trembling hands down into the room crying, *hap, hap*, the cry of the cannibal spirit. The people jump up and try to take hold of him, but when they reach the roof he has disappeared again. Now the father announces that, on the following day, the novice will come back.

Early the next morning, the madman dancers assemble in the woods at a clearing which is set aside for their meetings. They are painted with their peculiar designs and wear their weapons. Then they dance and instigate each other to watch for mistakes which may be made and to have no pity upon the guilty ones. The people remain in anxious expectation in their houses awaiting the arrival of the novice. Suddenly his cries are heard on the beach, not far from the village. All rush out of the house, run up to him and hold him. He is in a state of ecstasy and sings the new song which he received from the spirit. The people sit down around him and

learn the new song. At the same time they gather hemlock branches which they wind around their heads and around their necks. After they have learned the songs, the men take up a plank on which they beat time to accompany the tune. The women walk ahead and dance in honor of the novice, while he himself goes forward dancing the peculiar cannibal dance. He is surrounded by a number of assistants who shake rattles which are believed to have the effect of quieting him. Thus they slowly approach the village and arrange themselves in front of the dancing house, where the master of ceremonies and his speaker await their arrival. The former has the general charge of the ceremony. He arranges the dances, and now he hails the return of the novice, praising the power of the spirit who initiated him. But the novice is possessed of the desire of devouring men. He does not want to enter the house and all the singing of the people does not avail. Then one of his assistants strips off his clothing and offers to the cannibal his chest, his arms and his legs. He is called "the bait of the cannibal," because he offers himself to him as a bait is offered to a fish. The cannibal bites his arm and is then led into the house. Finally, he bites a piece of flesh out of the arm and then begins his dance. He dances in a squatting position, his arms first extended to the right, then to the left. He tries to attack the people, but is held by two assistants, who hold him by his neck-ring and shake their rattles in order to quiet him. Thus he dances around the fire four times. Then suddenly he disappears and comes forth again, wearing the mask of the spirit which initiated him. The dancer who wears the mask is crouching down and chattering with the movable jaw of the mask, while he shouts at the same time, *hap, hap!* the cry of the cannibal spirit. In this dance the novice personates the spirit which protects him. The two dances are repeated in the same order. During all this time the people sing and dance in order to appease the novice, who is getting more and more quiet, and finally disappears in a room which is set apart for his use. Then his father invites the people to stay in the house and gives them a feast.

Meanwhile, the novice must remain in his secret room. In the evening the people assemble again and he repeats his dances of the morning, again biting the people. In olden times—and that not very long ago—slaves were slain at this occasion and eaten by the new cannibal, who ate the first morsel, to be then joined by the other older cannibals. For four nights these ceremonies are repeated. Then the cannibal has become calmer and his holy fury begins to leave him. He has no further desire for human flesh, and all that

remains to be done is to cleanse him. This is a long and elaborate ceremony, which is performed in the dead of night, few witnesses only being admitted. The whole body of the cannibal is washed in a prescribed manner. Then he is wiped and finally smoked. Even after this cleansing he must abstain from many actions. He must not eat with other people, he must not touch the brim of a cup, but drink through the wing-bone of an eagle; he must not go out of the door of the house, but use a separate entrance, until finally, after four months, he is free again to join the rest of his tribe.

In conclusion I wish to make a few remarks on the history of the curious ceremonial which I have here described in hasty outlines. An inquiry into its origin reveals facts which throw a new light upon a great part of the early history of the North American aborigines, and which are also suggestive for a proper understanding of the development of religious ceremonial. I indicated before that the whole ceremonial is based upon legends, many of which convey the impression of great antiquity. Many of the stories which are told to account for the origin of portions of the ceremonial are ancient legends, which we are accustomed to consider as part of the oldest lore of mankind. Therefore the inference seems justified that the greater portion of the ceremonial must be very old.

A comparative study of the fundamental legends shows, however, that this view is quite untenable. When scanning collections of traditions from neighboring tribes and from others who live in remoter territories and to whom the ceremonials of the Kwakiutl are entirely unknown, we find many a one which is in all essential parts identical with those of the Kwakiutl, and very often the weight of the evidence is such that we must assume that the legend was borrowed by the Kwakiutl from a foreign tribe and introduced into the winter ceremonial. I have carried out this inquiry in great detail and reached the conclusion that many of these tales were carried down Columbia River after having crossed the Rocky Mountains. Then they spread along the Pacific Coast until finally they reached the Kwakiutl. But this is not all. There are quite a number of points of resemblance, even of identity, which clearly point to an importation of ideas from Asia. I told before of a story of the magic flight of four brothers, one of whom threw a whetstone, a bottle of oil and a comb over his shoulder, which were transformed into a mountain, a lake and a thicket. In Indian tales we find a fleeing couple throwing earth, water, thorns and fire over their shoulders. We find the same incident in a story from the Scotch Highlands and in another one from the Samoyedes; in fact,

it is one of the most widely spread tales of the Old World, and since, in America, it seems to be confined to the North Pacific Coast, which is so near Asia, I conclude that it was imported there from the Old World. We conclude from these facts that the mythology explaining the ritual of the winter dances is not as old as it seems, but brought together from numerous sources and comparatively recently. Although apparently the ritual is based on the myths, it seems that much more probably the myths of foreign peoples were appropriated in order to explain and develop a ritual which originally consisted only of disconnected dances. In order to give it greater weight it was connected with these myths and thus by degrees an elaborate ceremonial and an elaborate mythology developed from insignificant sources, the one sustaining the other. This phenomenon may be observed often in studies of the ceremonials and rituals of mankind, and we may pronounce it a general law that wherever a ritual is found, a mythology will begin to form around it and will in its turn enrich and diversify the ritual.

The geographer, from the study of our small groups of phenomena, derives the conclusion that transmittance of culture by intertribal trade has taken place all over the American Continent and that points of contact between the Pacific Coast of the Old World and of the New World must have existed for very long periods.

THE AMERICAN ASSOCIATION.

The forty-fifth meeting of the American Association for the Advancement of Science was held in Buffalo beginning with the meeting of the Council on Saturday, August 22d. The general sessions opened on Monday and the meeting continued throughout the week until Saturday, which was given to excursions. It is worthy of note that this was the fourth meeting held in Buffalo, the Association having met there every tenth year since 1866.

At the first general session the retiring President, Professor Edward W. Morley, called the meeting to order and introduced the President-elect, Professor Edward D. Cope. Bishop Charles H. Fowler, D.D., pronounced the invocation. The Hon. Edgar B. Jewett, Mayor of Buffalo, delivered the address of welcome from the city, and Professor Cope responded. In the afternoon eight vice-presidents delivered addresses before their respective sections; and in the evening the retiring President gave a learned address before the Association on the subject, "A Completed Chapter in the History of the Atomic Theory."

Vice-President B. K. Emerson, of Amherst, Mass., chose for the subject of his address before the Section of Geology and Geography, "Geologic Myths." He announced that he would speak of "The Chimaera, or the poetry of petroleum; of the Niobe, or the tragic side of calcareous tufa; of Lot's wife, or the indirect effect of cliff erosion; and of Noah's flood, or the possibilities of the cyclone and the earthquake wave working in harmony."

The myth of the Chimaera, he said, was told in its earliest form by Hesiod, who lived about nine centuries before the Christian era; and a little later by Homer. In each of these verses, which he quoted, the Chimaera is represented as a huge monster having the head of a goat, the body of a lion and the tail of a serpent, from whose mouth and nostrils issue flames of fire. Tracing the origin and development of this myth, Professor Emerson showed that it was derived from the remarkable geological phenomenon of natural gas burning on the peak of a mountain of serpentine and limestone in Lycia. This burning mountain was seen by Admiral Beaufort while off the coast of Lycia toward the end of the seventeenth century; and according to tradition it has burned there for nearly 3,000 years. "Ruins of an ancient temple of Vulcan near by and a little Byzantine church show how strongly it has impressed the inhabit-

ants in all ages." The Phœnician word Chimaera means burning mountain; the Greek word for goat has nearly the same sound; and in this way came about the myth of "a goatlike form vomiting flames and ravishing in the mountains of woody Lycia."

In tracing the myth of Niobe, the Professor said, "As one climbs from the Gulf of Smyrna, between Mount Tmolus and Sipylus, . . . high up in the vertical limestone, there appears the colossal bust of a woman standing on a high pedestal and in a deep alcove. It is cut out of the living rock, like the Swiss lion at Lucern." This is the "almost prehistoric" statue of the great Mother Cybele or the Mētēr Sipylene—gods of the Phœnicians—and is the origin of the Niobe myth. The dripping of the water from the limestone roof of the alcove has caused the "stalagmite tears" and the masses of rock dislodged from the cliffs around her by the action of the sun and rain are her children, slain by the arrows of Phœbus. From this geological phenomenon acting on the ancient stone sculpture the poetic mind of the Greek created the myth of Niobe weeping for her children.

The column of salt, known as Lot's Wife, is still standing in the Dead Sea. It owes its origin to geological changes in that region; and it owes its continuation to the action of the erosion. The name is supposed to be derived from some old word having the sound of Lot's wife.

The Professor gave an erudite history of the Flood myth, tracing it through all times and countries, and showing its remote antiquity by the statement that in the annals of the Babylonians, which can now be traced back 3800 B. C., no certain account of a flood has yet been found. In demonstrating that all these flood myths arise from natural geological phenomena, he recalled various similar catastrophes in modern times, such as the last terrible earthquake waves in China and Japan.

Miss Alice C. Fletcher of Washington, D. C., Vice-President of the Section of Anthropology, spoke on "Emblematic use of the Tree in the Dakotan Group." The tribes of the Dakotan or Siouan linguistic stock aggregate in number about 45,000 Indians. Certain tribes of this stock, at the beginning of the seventeenth century, occupied a strip of land along the Atlantic Coast, now within the limits of North and South Carolina, and were gradually driven west by their warlike neighbors, the Algonquins and Iroquois, becoming extinct as tribes within the historic period. The rites, and customs of the Siouan Indians were necessarily influenced by contact with other tribes during their wanderings; but the eastern,

southern and western tribes seem to have been under the influence of certain religious cults which were fundamentally the same. These religious ideas were important factors in organizing the tribal structure. The Indian religions, like those of the Eastern Continent, seem to start from the utterance of a seer; and it is this idea which always forms the vital spark of the religion, no matter how much it is encrusted in superstitions and ceremonies. Belief in animism is common among the Indians, as well as its accompanying belief in the continuity of life in the hereafter. The mysterious power to which the Indian addressed his prayers was called in the Omaha and Ponka tribes, *Wa-kan-da*, meaning to bring to pass. The Indian believed that this power pervades all nature, animate and inanimate, and therefore to him "all things became anthropomorphized." An old Indian once said to Miss Fletcher, "The tree is like a human being, for it has life and grows, so we pray to it and put our offerings on it, that the mysterious power may help us." To the rock he prayed for long life. He believed also that after a period of privation, fasting and prayer, a manifestation of this mysterious power would come to him in a vision. The form of this vision was ever after the totem of his clan, for men having similar visions affiliated into societies or gentes. This was an important step in social development. The Thunder gentes, from the nature of the manifestation, were always the most authoritative; thunder itself being the god of war. In the Omaha tribe the Sacred Tent of War was set aside for the ceremonies connected with Thunder; and in this tent among other things was the cedar pole, called *Wa-ghdhe-ghe*, meaning the power to bestow honours. The abode of the Thunder Birds was supposed to be in the cedar tree. The honours bestowed were those for bravery in war. The next important step in the social progress of these tribes is marked by the Omaha ceremony of the *He-di-wa-chi*, "one of the simplest and probably oldest ceremonies to draw the people together and unite them into an organized body." In this too the tree was the sacred object,—the pole about which the people danced,—the recognized symbol of the all-powerful Thunder, which in turn was the manifestation of the mysterious power, *Wa-kan-da*. Later, when the Omaha ceremony of the Sacred Pole was established, the name, *Wa-ghdhe-ghe*, which had been given to the cedar pole in the Tent of War, was applied to the Sacred Pole; but the honours bestowed were those won in peace; for, according to the legend, "The ceremonies of the Sacred Pole were devised to hold the people together."

In the Section of Geology and Geography a special meeting was held to commemorate the sixtieth anniversary of Professor James Hall's connection with the Geological Survey of the State of New York, and to take public recognition of his long-continued and valuable scientific work. The venerable and distinguished scientist, who is one of the founders of the Association, was present at the meeting and responded to the addresses made in his honour.

A paper which excited general interest was that read by Rev. Horace C. Hovey of Newburyport, Mass., on "The Making of Mammoth Cave," embodying some of the results of his recent explorations in Kentucky. Mr. Hovey has had thirty years' experience in cave exploration, and he described in glowing words the beauties and dangers of such experience. With the coöperation of Dr. R. E. Call, he has reexplored nearly all of the 200 avenues, rooms, pits and domes of Mammoth Cave. The depth of these pits has been so much exaggerated that Mr. Hovey's party undertook the dangerous and difficult task of sounding them to obtain accurate measurements. The so-called Bottomless Pit was found to be 105 feet in depth. The whole region of about 8,000 square miles, in the midst of which Mammoth Cave and many other similar caverns are found, owes its present form, he said, to simple erosion. The great size of the cave is due to the fact that it comprises many caves and grottoes whose walls have been worn away, and also to the absence of natural causes that usually destroy underground passages. The layer of sandstone overlying the limestone from which the cave is excavated is the cause of the scarcity of stalagmites. The pits and domes play an important part in forming the cave; and it has been considered by eminent authorities that they were made by the action of whirling water and pebbles from above downward. Mr. Hovey gave good evidence that they were caused by solution through the agency of acidulated water. The subterranean rivers, although easily navigable in summer, are combined in winter into a mighty rushing current, which is a powerful agent in hollowing out the long horizontal passage ways and undermining the arches, thus making the successive galleries for which the cave is noted. Mr. Hovey's conclusions are that none of the ordinary causes of cave-making, such as whirling water and pebbles, have had much to do with the making of Mammoth Cave; he believes that it has been made almost entirely by the chemical and mechanical action of water.

Mr. Hovey read another paper on the newly-discovered cave, not far from the Mammoth Cave, called the "Colossal Cavern."

This remarkable cave was discovered by Mr. Pike Chapman in 1895. It is of great size, and is supposed to be connected in a circuitous way with Mammoth Cave. It is attracting much attention, but has been as yet only partially explored.

As in previous meetings at Buffalo, the subject of Niagara Falls naturally claimed much time and attention. Many papers bearing upon the various aspects of the subject were represented in Section E. Mr. G. K. Gilbert, of the United States Geological Survey, gave three papers, as follows: "The Algonquin River," "The Whirlpool, Saint David's Channel," and "Profile of the bed of the Niagara in its Gorge."

One of the public lectures given by the Association to the citizens of Buffalo was on "Niagara as a Time Piece," by Dr. J. W. Spencer, of Washington, D. C. The age of Niagara has been estimated for the past 100 years by dividing the length of the gorge by the supposed rate of recession. In early times this was chiefly by guess, but we now have correct measurements of the modern rate of recession obtained by comparison of surveys of the Cataract. These show that Horseshoe Falls has a mean annual recession of a little more than four feet. Many other factors must enter into a calculation of the age of the Falls, among which is the fact that the recession in the past was from natural causes slower than in the present. Taking everything into consideration, Dr. Spencer considers Niagara as the best chronometer, although imperfect, of geologic time. It is also of great interest in connection with the glacial period and the antiquity of man.

This lecture, together with the papers in Section E, served as excellent preparation for the enjoyment of the day's excursion to Niagara Falls and Gorge, which was planned by the local committee for the benefit of the Association.

Dr. D. G. Brinton presented in Section H the following resolution: "Whereas, the influence which the environment of the New World has exerted upon the physical and mental development of the white race is a question of the utmost scientific and practical importance; and whereas, there appears to be no governmental or scientific bureau which is giving this subject attention at the present time; therefore, Resolved, That the A. A. A. S. appoint a committee to organize an ethnographical investigation of the white race in the United States with special reference to the causes exerted upon it by its new surroundings; said committee to report annually to the Association." The resolution was adopted by the Association, and the following committee was appointed: D. G.

Brinton, J. McKeen Cattell, W. W. Newell, W. J. McGee and Franz Boas.

Professor F. W. Putnam gave a talk in Section H on the Recent Explorations in Honduras by the Peabody Museum. For the past five years explorations have been carried on at the Ruins of Copan, and the Museum has the exclusive right to continue these explorations for five years to come. The first attempt at extensive excavations on the sites of the ancient cities of Central America and Yucatan was made by the expeditions from this Museum. Although the huge stone monuments and sculptures, described by Stephens and later by Maudslay, are undoubtedly very old, explorations beneath the surface have brought to light evidence of far greater antiquity.

Professor G. Frederick Wright, of Oberlin, Ohio, presented "Fresh Geological Evidence of Glacial Man at Trenton, New Jersey." This evidence was based on the explorations of Mr. Ernest Volk, now carried on under the direction of Professor Putnam for the American Museum of Natural History. At a place called Lalor's Field, in the presence of Professor Wright, a trench was dug in order to show the several strata. In the top layer of black soil, about one foot in thickness, were potsherds, broken and perfect implements of chert, jasper, quartz, quartzite and argillite. The stratum below the black soil is composed of yellow glacial sand, varying from one to three feet in thickness. In this glacial sand, chips and broken argillite implements were found, and a few fire-split quartzite pebbles. Below this stratum is one of yellowish white sand, six inches thick, resting on the red clay. The important conclusion to be drawn from this and other similar excavations is the fact that in the *glacial* sand deposit only argillite implements are found, while in the soil above are all the objects characteristic of the later or "Indian" occupation. This early use of argillite by the people of glacial, and probably of pre-glacial time, has received many confirmations since first pointed out by Dr. Abbott; and the evidence now presented by Mr. Volk's most recent exploration is of special interest and importance in connection with Glacial Man.

Professor Putnam supplemented this paper with remarks corroborating the above statements and exhibiting a small collection which was taken from another trench in the same region.

Professor E. W. Claypole, of Akron, Ohio, read a paper on "Human Relics in the Drift of Ohio." His conclusion is that the finding of several implements in the drift of Ohio during the past

few years strengthens the belief in the co-existence of man with the ice sheet in north central Ohio.

Mr. E. O. Hovey, of New York, read a paper on the Artesian well sunk at Key West, Florida, in 1895. In boring to a depth of 2,000 feet it was found that the upper layer of 50 feet was of limestone formed of coral *in situ*, but below that the limestone was of sedimentary origin, chiefly beach sand. This is evidence in favor of the theory that the Florida peninsula is not composed mainly of natural coral formation.

Mr. J. E. Todd spoke of the "Hydraulic Gradient of the Main Artesian Basin of the Northwest." The largest known artesian area is that which extends from Nebraska and Dakota to the Rocky Mountains and about a thousand miles north and south. The water is contained in the clayey layers of the Dakota sandstone overlaid by impervious clays and shales. The pressure of the water increases with the depth of the layer; it is also greater toward the western part of the area. The variation of pressure at the same level is due to leakage. The pressure is sometimes 200 pounds to the square inch, and at Huron, South Dakota, the water rises 400 feet above the surface.

In consideration of the fact that the British Association for the Advancement of Science will hold its meeting of 1897 in Toronto, beginning on August 18, the American Association has decided to accept the invitation of the City of Detroit and to begin its meeting on August 9. This time and place will enable the members of each association to attend the meetings of the other. A cordial invitation has been extended to the members of the British Association to become the guests of the American Association, and a most courteous invitation has been received by the American Association from the Toronto Committee to join in the meeting at Toronto.

The President-elect for 1897 is Dr. Wolcott Gibbs, Professor Emeritus of Harvard University. In 1898 the Association will celebrate its fiftieth anniversary. At the Buffalo meeting much interest was shown in this anniversary meeting, which will be one of the great scientific events of the century in America.

A GRAPHIC HISTORY OF THE UNITED STATES.

BY

HENRY GANNETT.

This is not a history of the Government or of the people of the United States, but an outline, expressed mainly by means of maps, of the changes in the territory of the country as a whole and of the different States since it became one of the powers of the earth.

Upon the conclusion of the treaty of peace with Great Britain, at the close of the War of Independence, our home was limited on the south by the 31st parallel of latitude, and the present northern boundary of Florida. The western limit of our jurisdiction was the mid-channel of the Mississippi River, and from its source a line run due north to the Lake of the Woods. The area of our domain was then 827,844 square miles, or less than a fourth what it is at present.

At that time our territory consisted of the 13 original States, which then comprised, besides their present areas, those of Maine, Vermont and West Virginia. Between the western limits of the original States and the Mississippi River stretched a region practically unsettled, which was claimed by these States. Georgia claimed the territory between the 31st and 35th parallels, which now constitutes most of Alabama and Mississippi; North Carolina claimed what is now Tennessee; Virginia claimed what is now Kentucky, together with an extensive region in Ohio, Indiana and Illinois. New York, Connecticut and Massachusetts also claimed territory in the region north of the Ohio, their claims, with those of Virginia, overlapping one another in a perplexing manner.

As the simplest method of settling these claims, the States ceded their western territories to the United States, with the single exception of the area which is now Kentucky, which, instead of being ceded, was erected into a State. These cessions were made by the several States between 1781 and 1802. The area north of the Ohio was in 1788 organized as the Territory Northwest of the River Ohio. The area now constituting the State of Tennessee, although never organized as a Territory, was known as the Territory South of the River Ohio. The State of Tennessee was created in 1796.

LOUISIANA PURCHASE.

Settlement at that time was confined mainly to the Atlantic coast and did not extend far inland, and when, in 1803, Bonaparte offered to sell us that great tract of land which lay west of the Mississippi for a song, no thought of the need of the land itself for our expand-

ing population was in the minds of our legislators when they closed with his offer. They thought of the free and unrestricted navigation of the Mississippi River from its head to its mouth, and it was mainly, if not entirely, for this that they paid the price and received the deed. The price paid was \$12,000,000, and the assumption by the United States of certain claims which its citizens had against the French Government, known as the French Spoliation Claims, the total amount of which was estimated at \$3,750,000.

Louisiana comprised all the basin of the Mississippi River upon the west side of the main stream as far south as the head of the Arkansas in Colorado. From this point the boundary line followed the Arkansas River eastward to the 100th meridian, thence south along this meridian to Red River, and down Red River to what is now the west boundary of Louisiana, which it followed to the Gulf. The area is estimated at 897,931 square miles.

With the acquisition of Louisiana came that of Oregon, which originally comprised not only the present State of Oregon, but Washington, Idaho, and a small part of Montana. Since we had, by purchase, acquired all the country east thereof, this region, which was practically without an owner, fell naturally into our hands.

The entire area thus acquired, including Louisiana and Oregon, comprised 1,171,931 square miles, an area much greater than our original territory.

THE FLORIDAS.

The east boundary of Louisiana, in the extreme south, was indefinite, and for many years after its acquisition was a bone of contention between this country and Spain, which at that time was the owner of the Floridas. This was settled in 1819 by their purchase from that country. The area thus obtained was 59,268 square miles, and the price was \$5,000,000.

TEXAS.

In 1845 Texas, which several years before had achieved her independence of Mexico, sought and obtained admission to the United States. At that time its limits west of the 100th meridian extended north to the Arkansas River and west to the Rio Grande, and this accession of territory increased our area by 375,239 square miles.

FIRST MEXICAN CESSION.

Then followed the war with Mexico, one result of which was the acquisition by the United States in 1848 of what is known as the First Mexican Cession, which comprised the present areas of California, Nevada and Utah and parts of Wyoming, Colorado, New

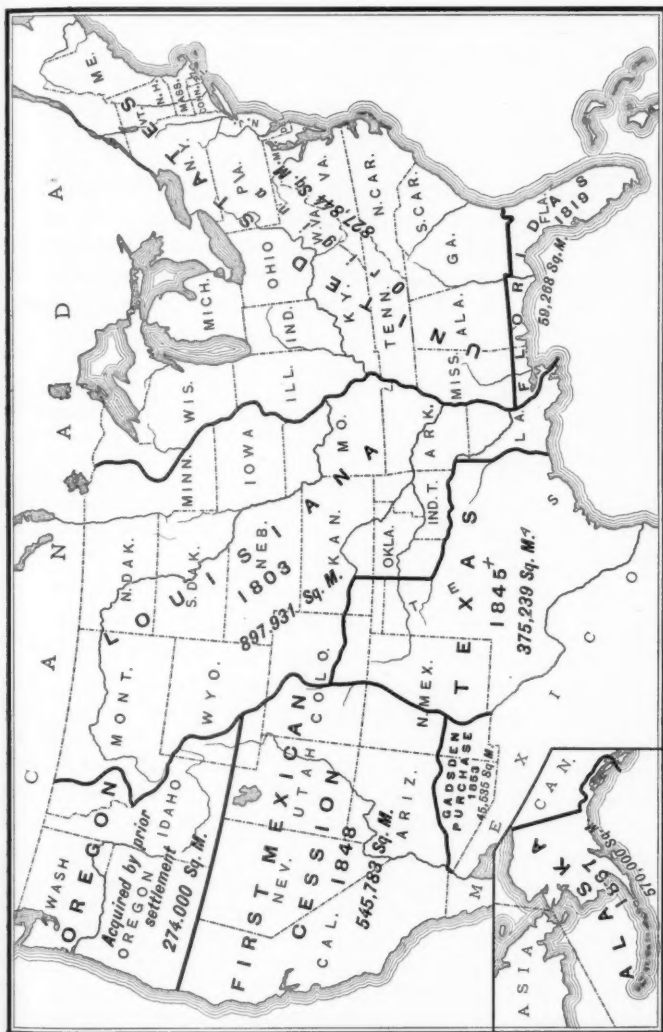


PLATE NO. 1. UNITED STATES, SHOWING ACCESSIONS OF TERRITORY.

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Mexico and Arizona. The area of the cession was 545,783 square miles and the price paid therefor was \$15,000,000.

GADSDEN PURCHASE.

Five years later another addition was made, known as the Gadsden Purchase, which is now in New Mexico and Arizona. The area of this purchase was 45,535 square miles and the price paid was \$10,000,000. This purchase completes the main body of our country, the only other cession of territory being that of Alaska, which was purchased from Russia in 1867 for \$7,200,000.

The above facts are summarized in the following table, showing the cessions of territory, with their dates, areas, and the prices paid therefor, and the limits of these different cessions are shown graphically on the map constituting Plate No. 1.

ACCESSIONS OF TERRITORY.

	YEAR.	AREA.	COST.
Original area.....		827,844	.....
Louisiana.....	1803	897,931	\$15,750,000
Oregon.....		274,000	.....
Florida.....	1819	59,268	5,000,000
Texas.....	1845	375,239	.....
First Mexican Cession.....	1848	545,783	15,000,000
Gadsden Purchase.....	1853	45,535	10,000,000
Alaska.....	1867	570,000	7,200,000
Total.....		3,595,600	

HISTORY OF THE STATES.

The Government was organized by 13 States. Since then 32 others have been formed and admitted, and these 45 States, with 4 Territories, the District of Columbia and Indian Territory, make up the entire country. Of the 13 original States, 9, namely, New Hampshire, Rhode Island, Connecticut, New Jersey, Pennsylvania, Delaware, Maryland, and North and South Carolina, have not been changed since the adoption of the Constitution, excepting perhaps to a trifling extent by reason of adjustment of boundary lines, or, in the case of Maryland, by the formation of the District of Columbia and of Pennsylvania by the addition of what is now part of Erie County. The other 4, namely, Massachusetts, New York, Virginia and Georgia, have been greatly changed, Massachusetts by the loss of the District of Maine; New York by being shorn of Vermont; Virginia by the formation of West Virginia and Kentucky, and Georgia by the formation of Alabama and Mississippi.

Of the 31 States which have been admitted, 8, namely, Florida, Alabama, Kentucky, Tennessee, Montana, Wyoming, Colorado and California, have not been changed in area since they first

appeared, whether as States or Territories. All the others have been changed in area since the organization of the Territory, and many of them have sustained numerous changes of area, so that their history is somewhat complex.

Of these 32 States, 4, namely, Tennessee, Kentucky, Ohio and California, never were organized as Territories, at least under those names. Louisiana was a Territory under the name of Orleans, and North and South Dakota under the name of Dakota.

The following table summarizes the above facts and gives the years of the organization of the Territories and the admission of the States:

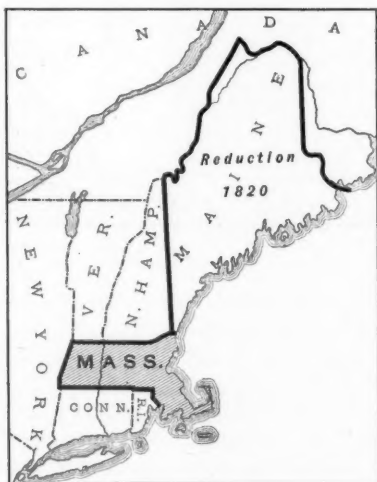
	ORGANIZATION OF TERRITORY.	ADMISSION OF STATE.	AREA.
1. Alabama	1817	1819	Unchanged.
2. Arizona	1863	....	Changed.
3. Arkansas	1819	1836	"
4. California .....	....	1850	Unchanged.
5. Colorado	1861	1876	"
6. Connecticut .....	....	Original	"
7. Delaware .....	....	"	"
8. District of Columbia	1790	....	Changed.
9. Florida	1822	1845	Unchanged.
10. Georgia .....	....	Original	Changed.
11. Idaho	1863	1890	"
12. Illinois	1809	1818	"
13. Indiana	1800	1816	"
14. Iowa	1838	1845	"
15. Kansas	1854	1861	"
16. Kentucky .....	....	1792	Unchanged.
17. Louisiana	1804 (Orleans.)	1812	Changed.
18. Maine .....	....	1820	Unchanged.
19. Maryland .....	....	Original	"
20. Massachusetts .....	....	"	Changed.
21. Michigan	1805	1837	"
22. Minnesota	1849	1858	"
23. Mississippi	1798	1817	"
24. Missouri	1812	1821	"
25. Montana	1864	1889	Unchanged.
26. Nebraska	1854	1867	Changed.
27. Nevada	1861	1864	"
28. New Hampshire .....	....	Original	Unchanged.
29. New Jersey .....	....	"	"
30. New Mexico	1850	....	Changed.
31. New York .....	....	Original	"
32. North Carolina .....	....	"	Unchanged.
33. North Dakota	1861 (Dakota.)	1889	Changed.
34. Ohio .....	....	1803	"

	ORGANIZATION OF TERRITORY.	ADMISSION OF STATE.	AREA.
35. Oklahoma	1889	....	Changed.
36. Oregon	1848	1859	"
37. Pennsylvania.....	....	Original	Unchanged.
38. Rhode Island.....	....	"	"
39. South Carolina.....	....	"	"
40. South Dakota.....	1861 (Dakota.)	1889	Changed.
41. Tennessee .....	....	1796	Unchanged.
42. Texas.....	....	1845	Changed.
43. Utah	1850	1896	"
44. Vermont.....	....	1791	Unchanged.
45. Virginia .....	....	Original	Changed.
46. Washington.....	1853	1889	"
47. West Virginia.....	....	1863	"
48. Wisconsin	1836	1848	"
49. Wyoming	1868	1890	Unchanged.

In the following pages is given the history of each of those States whose area has been changed since its organization as a Territory. The main facts of the history are expressed by the maps which appear as cuts. In each one the shaded area is that of the present State, while the original area is surrounded by a heavy outline. The additions and reductions in area are so indicated upon the maps.

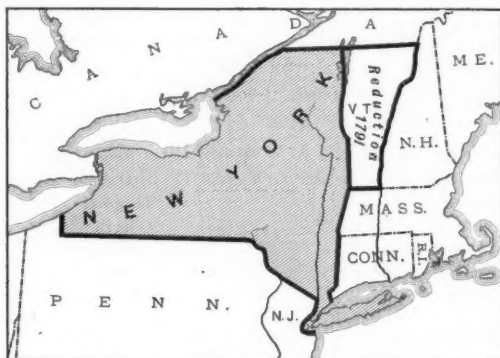
MASSACHUSETTS.

This State originally included Maine, which was cut off from it and made an independent State in 1820.



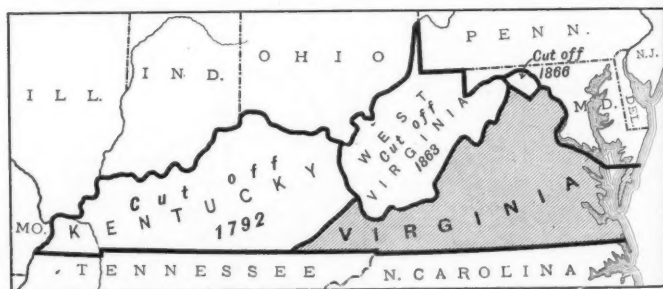
NEW YORK.

New York originally included Vermont, which was separated from it and made a State in 1791.



VIRGINIA AND WEST VIRGINIA.

Virginia originally included the areas of Kentucky and of West Virginia. In 1792 Kentucky was taken from it and made an independent State, and in 1863, in the midst of the civil war, West Virginia was cut from Virginia and admitted by itself. Three years later two counties more were taken from Virginia and added to West Virginia.

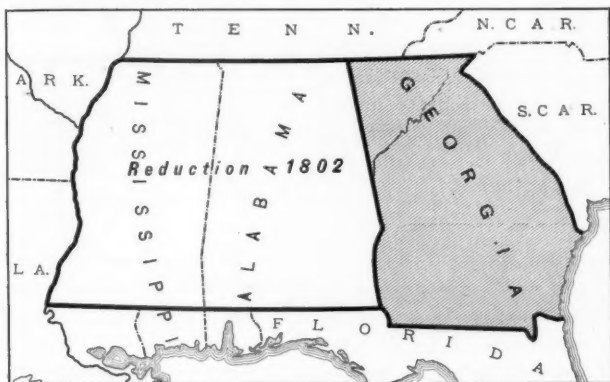


DISTRICT OF COLUMBIA.

This tract, the seat of the General Government, was originally 10 miles square, part of which was ceded by Maryland in 1788, and part by Virginia the following year. The Virginia part was re-ceded to that State in 1846. It was accepted by the United States and adopted as the seat of government in 1790.

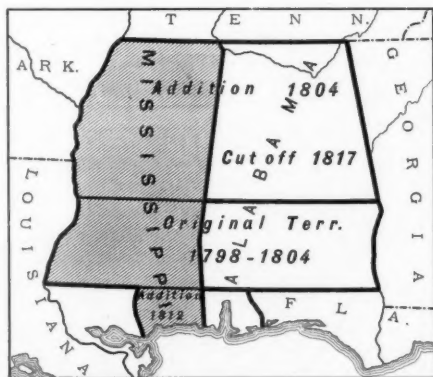
GEORGIA.

This State originally extended from the Savannah River to the Mississippi, and from its present southern boundary to the 35th parallel. In 1802 it ceded the country west of its present western limits to the United States.



MISSISSIPPI.

The original Territory of Mississippi was formed from a part of the lands ceded by Georgia to the General Government. It extended from the western boundary of Georgia to the Mississippi River, and from the 31st parallel to a parallel passing through the mouth of the Yazoo River. The limits of



this territory were extended northward in 1804 to the 35th parallel, so that it then comprised the present area of Mississippi and Alabama, with the exception of those parts lying south of the 31st parallel. This territory was reduced in 1817 by the formation of Alabama Territory, which comprised the present area of the State of Alabama, and was increased at the same time by that portion of the present State of Mississippi which lies south of the 31st parallel.

This gave the Territory its present limits, and with these limits it was admitted as a State in 1817.

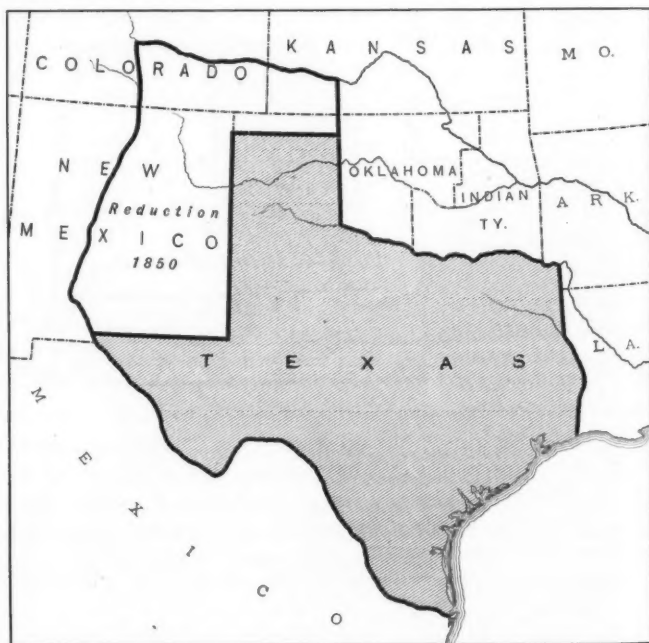
LOUISIANA.

In 1804 a portion of the Louisiana purchase, comprising the present State of Louisiana, with the exception of a small area in the southeastern part, was organized as a Territory under the name of Orleans. In 1812 it was admitted as a State under the name of Louisiana, and in the same year it was enlarged to its present limits.



TEXAS.

This State declared its independence of Mexico in 1835, and ten years later was admitted into the United States as a State. When admitted it extended on the west to the Rio Grande, and on the north, west of the rooth meridian to the Arkansas. In 1850 it sold to the United States, for \$10,000,000, the regions north and west of its present limits, which are now in New Mexico, Colorado, Kansas and Oklahoma.



ARKANSAS.

Arkansas was originally a part of Missouri Territory, and was set off in 1819. The territory then extended west to the 100th meridian, our western territorial line. This area was reduced in 1824 and again in 1828, when the present limits were established. It was admitted in 1836.



OHIO.

The territory northwest of the River Ohio was divided in 1800, the division line being a meridian through the mouth of Kentucky River. The western part became Indiana Territory, while the eastern part remained Northwestern Territory. In 1803 the part of this south of a parallel of latitude tangent to the south end of Lake Michigan and east of a meridian through the mouth of Great Miami River, was admitted as a State under the name of Ohio. The remainder of the Northwestern Territory was added to Indiana Territory.



Ohio was slightly increased in 1836, the northern boundary being changed to a great circle, running from the south end of Lake Michigan to the head of Maumee Bay. This change is too small to be represented on the map.

INDIANA.

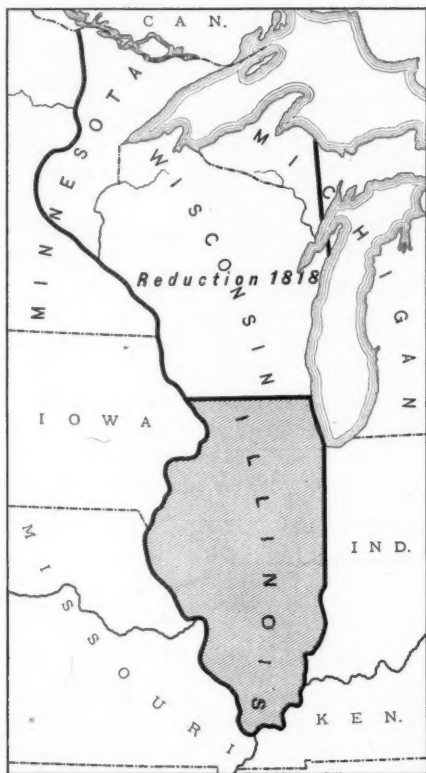
The Territory of Indiana was created in 1800, and comprised that part of the Northwest Territory lying west of a meridian passing through the mouth of Kentucky River. This was increased in 1803 by the addition of that part of the Northwest Territory remaining after the formation of Ohio. In 1805 the portion north of its present northern boundary and east of its present western boundary prolonged northward was set off as Michigan Territory, and in 1809 all the remainder of the territory outside of the present limits of the State became Illinois Territory. It was admitted in 1816.



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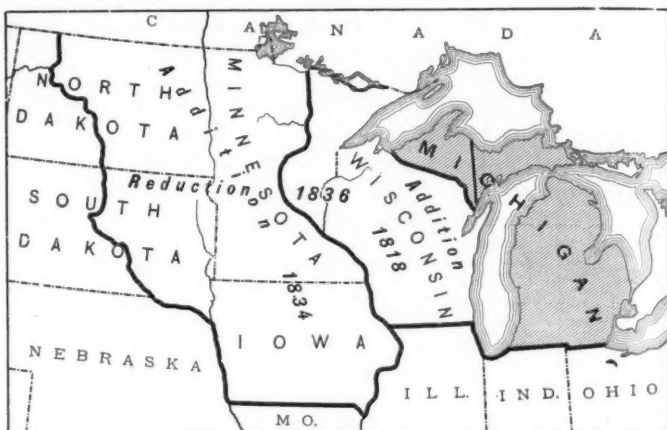
Illinois Territory, originally a part of Northwestern Territory and then of Indiana Territory, was organized in 1809. In 1818, upon its admission as a State, the portion north of its present limits was cut off and added to Michigan Territory.



MICHIGAN.

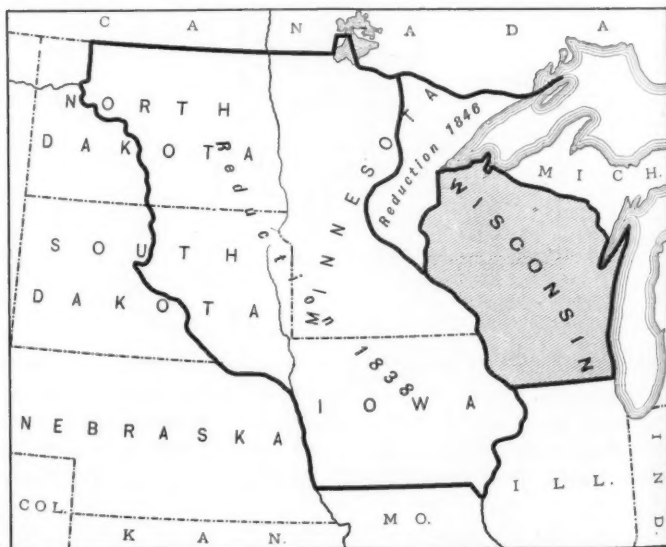
Michigan Territory was organized in 1805, and then comprised its present area, except the western portion of the upper peninsula. In 1818, its limits were extended westward to the Mississippi River, and in 1834 to the Missouri River. In 1836, it was reduced to its present limits, the portion cut off forming Wisconsin Territory,

and in 1837 it was admitted as a State. A trifling change was at the same time made in its southern boundary.



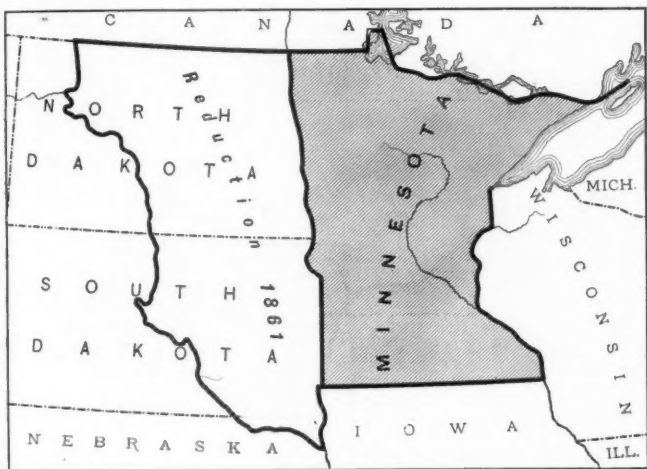
WISCONSIN.

The Territory was organized in 1836 from part of Michigan Territory. It was reduced in 1838 by the formation of Iowa Territory, and again in 1846, the area cut off at that time becoming a part of Minnesota in 1849. It was admitted as a State in 1848.



MINNESOTA.

The Territory was organized* in 1849 from parts of Iowa and Wisconsin Territories. It was admitted in 1858 with its present limits, and in 1861, the area outside these limits was included in Dakota.



IOWA.

This Territory was organized in 1838 from a part of Wisconsin Territory. In 1845, it was admitted as a State, but with limits very different from those at present, as it extended northward to the bend of Minnesota River, while its western boundary was much farther east than now. In 1846, its boundaries were changed to

those which it has to-day. In 1849, the remaining portion of Iowa Territory was annexed to Minnesota Territory.



MISSOURI.

In 1812, upon the organization of Orleans Territory, the remainder of the Louisiana purchase became Missouri Territory. Out of this great area, the Territory of Arkansas was carved in 1819, and in 1821 the State of Missouri was formed and admitted, with the limits as at present, excepting that the northern part of the western boundary was then a meridian through the mouth of Kansas River, instead of following the Missouri River. The change to its present boundaries was made in 1836.

Meantime, the name Missouri Territory continued to be applied to the remaining area. In 1834, the part of it lying east of the Missouri and White Earth rivers became a part of Michigan Territory, and in 1854 other parts became Kansas and Nebraska Territories, absorbing the remainder, with the exception of a narrow strip lying between Kansas and Indian Territory, which had been

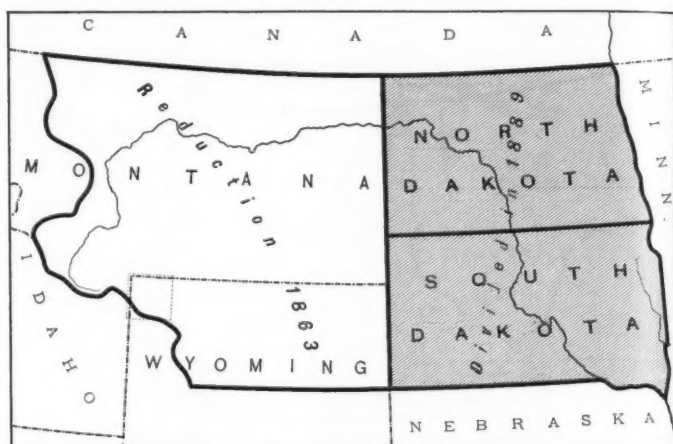
assigned to certain Indian tribes, and became part of Indian Territory and subsequently Oklahoma.



NORTH AND SOUTH DAKOTA.

Dakota Territory was formed in 1861 from parts of Minnesota and Nebraska Territories. The formation of Idaho Territory in 1863 reduced it nearly to its present dimensions, and in 1882 a small area in the southeast was transferred to Nebraska, completing

the reduction. In 1889 it was divided into North and South Dakota, and they were admitted as States.



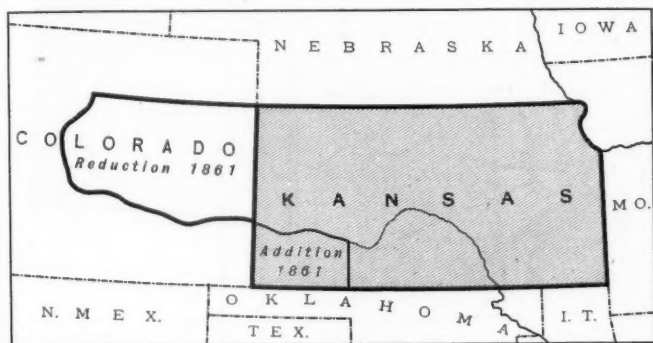
NEBRASKA.

The Territory was formed in 1854, from the northwestern part of Missouri Territory. In 1861 Colorado and Dakota Territories were formed, taking away most of its area and reducing it nearly to its present limits. It was admitted in 1867. In 1882 a small addition was made to it on the north by the transfer of a small tract from Dakota.



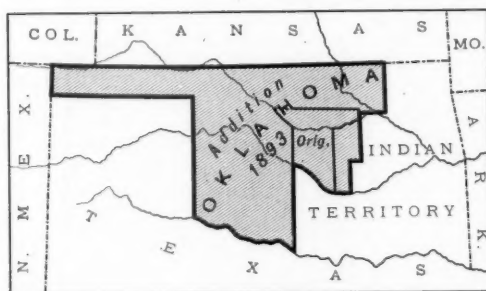
KANSAS.

Kansas Territory was organized in 1854 from part of Missouri Territory. Its western boundary was originally the 100th meridian, the Arkansas River, and the continental divide. In 1861 it was admitted as a State, its area being increased by the addition of the southwest corner, and reduced by the part now in Colorado.



OKLAHOMA.

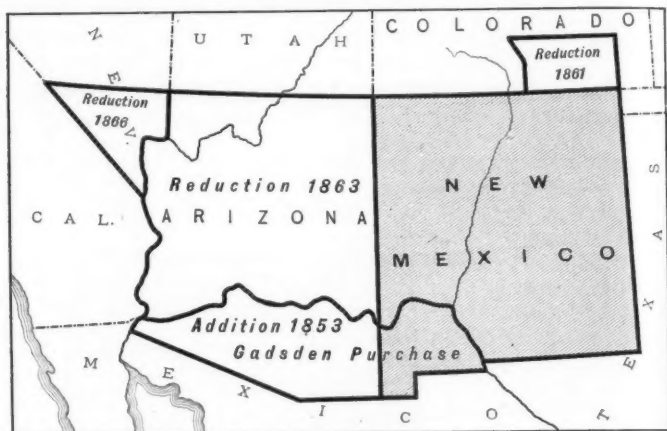
This Territory was organized in 1889. At that time it comprised only a small area in the heart of Indian Territory. In 1892 it was increased by the addition of the western half of Indian Territory.



NEW MEXICO.

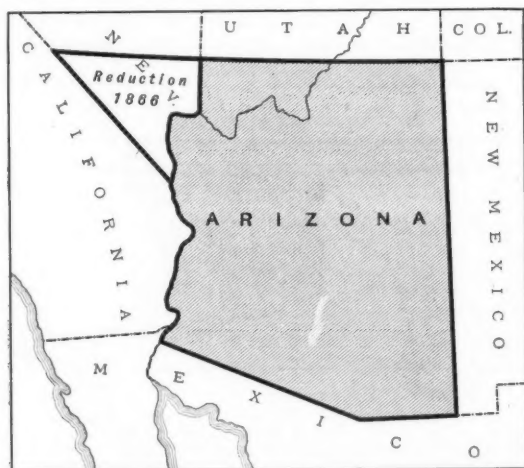
This Territory was organized in 1850, in part from the First Mexican Cession, in part from the Texas purchase. In 1853 the area of the Gadsden purchase was added to it. In 1861 the portion

north of the 37th parallel was added to Colorado, and in 1863 Arizona was cut off, leaving the Territory its present area.



ARIZONA.

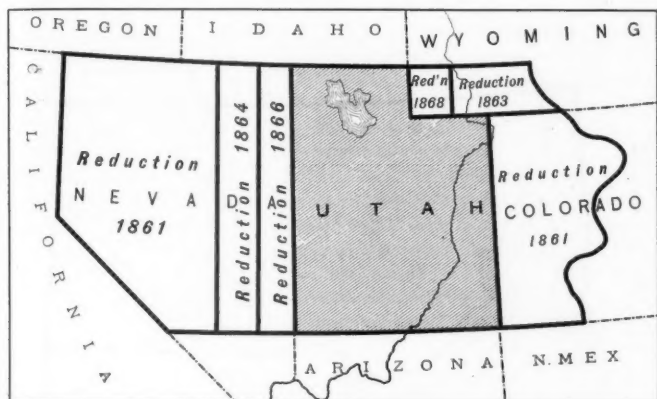
This was organized in 1863, being taken from New Mexico. Originally it comprised, besides its present area, a triangular tract now in Nevada, to which it was added in 1866.



UTAH.

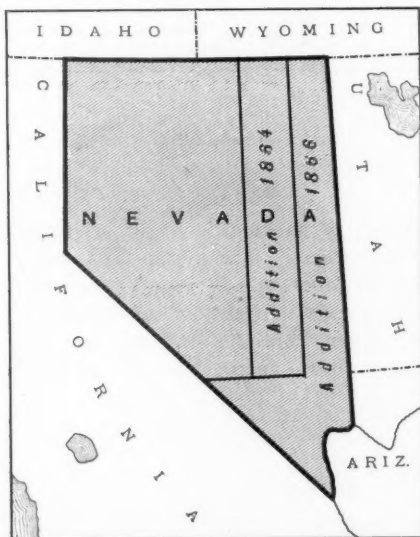
This Territory was formed in 1850 from part of the First Mexican Cession. It originally extended from the summit of the Rocky

Mountains west to the California boundary. In 1861, the formation of Colorado reduced it in the east and that of Nevada on the west. Further reductions were made on the west in 1864 and 1866, both being additions to Nevada, while from the northeast corner a tract was cut in 1863 to add to Idaho, and another in 1868, to increase Wyoming. These reduced the Territory to its present limits. It was admitted in 1896.



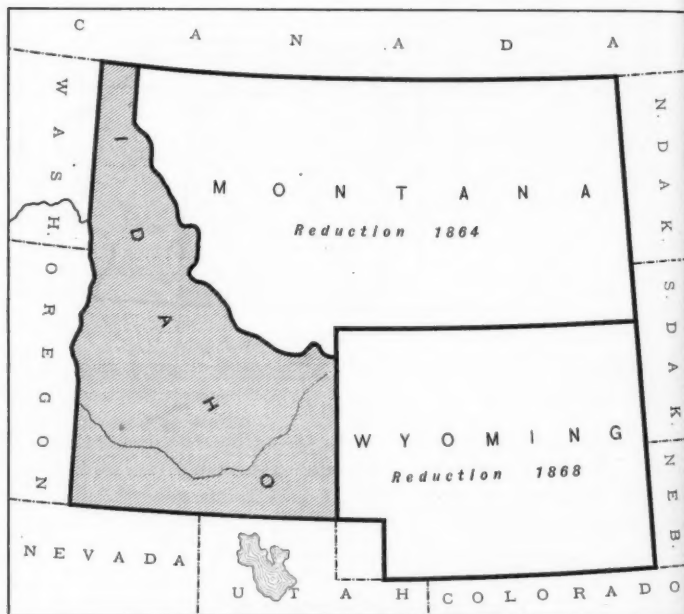
NEVADA.

Nevada Territory was formed in 1861 from the western part of Utah. In 1864 an addition was made to it from Utah, and in 1866 another addition, partly from Utah and partly from Arizona. It was admitted as a State in 1896.



IDAHO.

The Territory was formed in 1863 from parts of Washington, Dakota and Nebraska, and included, besides the present area of the State, all of Montana and nearly all of Wyoming. In 1864, Montana was taken from it, and in 1868, Wyoming. It became a State in 1890.



OREGON.

Oregon Territory, organized in 1848, originally included the present States of Oregon, Washington and Idaho, besides the northwestern part of Montana. In 1853, by the formation of Washington Territory, that part of it north of Columbia River and the 46th parallel was taken from it. In 1859, upon the formation of the State of Oregon, it was further reduced by that part lying east

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XUM

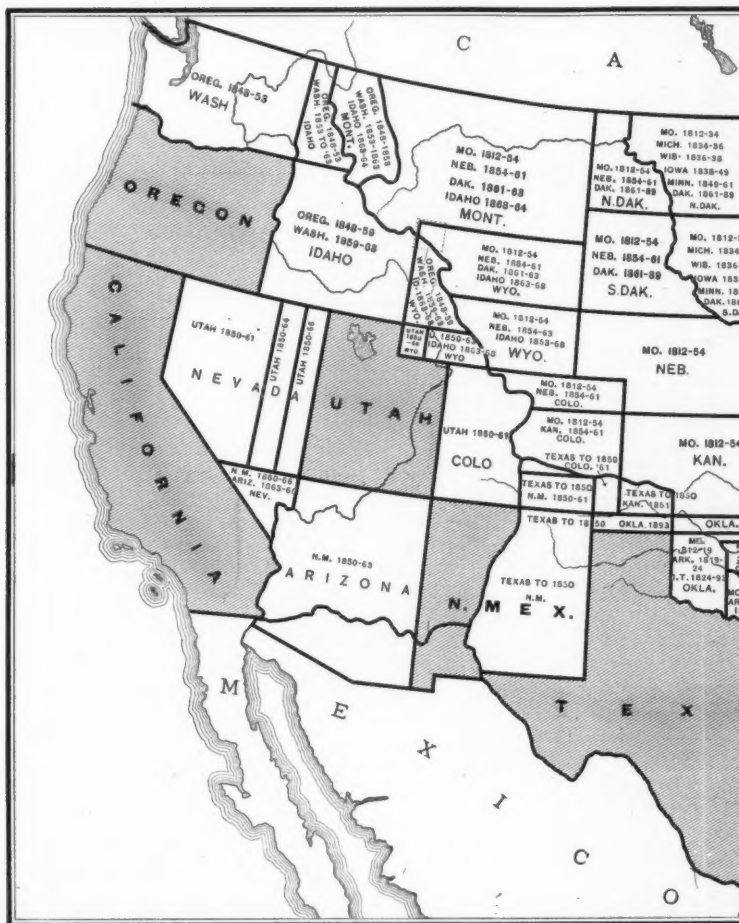




PLATE NO. 2.

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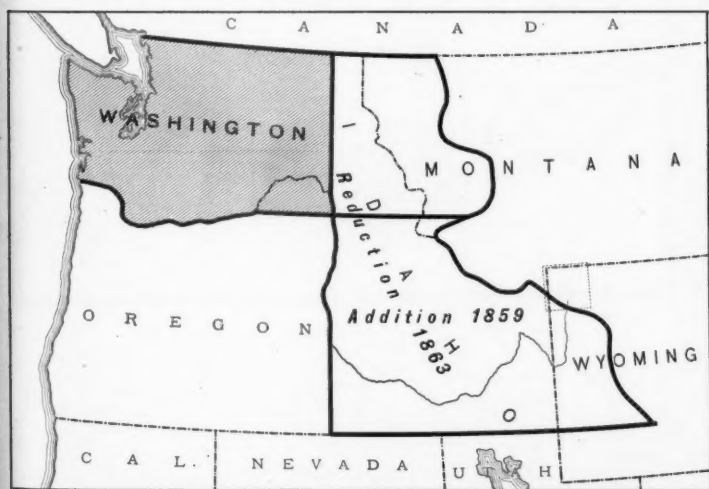


of Snake River and a meridian through the mouth of Owyhee River, which was also added to Washington.



WASHINGTON.

The Territory was formed in 1853 from Oregon Territory and then comprised the region west of the Rocky Mountains, north of Columbia River and the 46th parallel. It was increased in 1859, upon the admission of Oregon, by that part of Oregon Territory which lay east of the present limits of the State. In 1863, Washington was reduced to its present limits by the formation of Idaho Territory. It was admitted as a State in 1889.



Upon the map which constitutes Plate 2, all these changes are assembled. All the above parcels of territory into which the country has been divided by the different State and territorial lines, as they have been shifted from time to time, are here brought together, and the allegiance of each parcel at different times is shown, with dates. The shaded areas are those which have from the first been under the same jurisdiction. Thus the present area of Texas has always been Texas since it was a part of this country. The western portion of New Mexico has always been New Mexico. On the other hand, Kentucky was a part of Virginia up to 1792. Kansas was a part of Missouri Territory from 1812 to 1854. Illinois was part of Northwestern Territory from 1788 to 1800, and of Indiana from 1800 to 1809. A more complicated case is seen in the northeastern part of North Dakota, which has been under many different jurisdictions; Missouri Territory from 1812 to 1834, Michigan from 1834 to 1836, Wisconsin Territory from 1836 to 1838, Iowa Territory from 1838 to 1849, Minnesota Territory from 1849 to 1861, Dakota Territory from 1861 to 1889, when it became a part of the State of North Dakota. These illustrations will enable one to read the map. A study of it will show that a few small areas were apparently for years without jurisdiction. Of these, three small tracts north of the Panhandle of Texas, now in Oklahoma, Kansas and Colorado, are cases in point, and the triangular tract between the Arkansas River and the 38th parallel is another such case.

There are no fewer than 86 parcels of territory represented on this map, besides several which are too small to be shown. Each of these parcels has a different history.

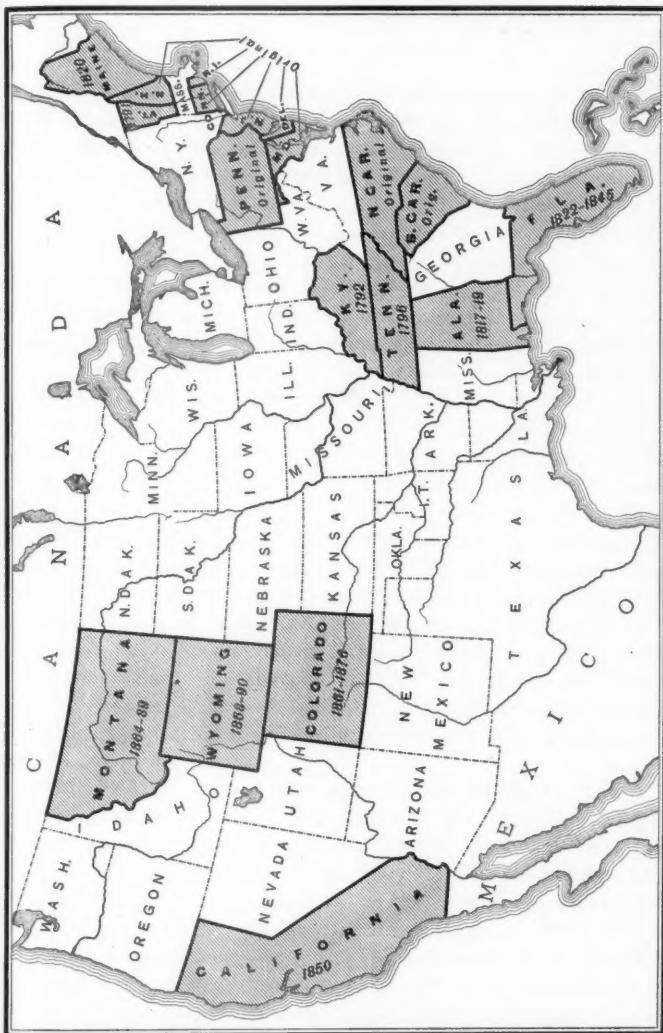


PLATE NO. 3. UNITED STATES, DISTINGUISHING BY SHADING THOSE STATES, WHOSE AREAS HAVE NOT BEEN MATERIALLY CHANGED SINCE THEIR FORMATION.

7

RECORD OF GEOGRAPHICAL PROGRESS.

THE POLAR REGIONS.

DR. NANSEN'S ARCTIC JOURNEY.—The safe return of Dr. Fridtjof Nansen and his entire party from their three years' voyage in the Arctic Ocean, with a record of many interesting discoveries, is an event of uncommon geographical interest and importance. Here are the chronology and main facts of their wanderings:

Period 1. The *Fram's* Voyage along the Coasts of the Old World (July 21 to Sept. 15, 1893).—Starting from Vardö the *Fram* made all haste through the Strait of Yugor and along the Asian coast, but was prevented by a storm from touching at the mouth of the Olenek River, where an additional supply of dogs had been collected. The course was then laid to the northeast in order to enter the ice-pack west of the New Siberian Islands.

Period 2. The *Fram's* Ice Drift to the Northwest, a year and a half, to Dr. Nansen's Departure on his Sledge Journey (Sept. 15, 1893, to March 14, 1895).—The *Fram* entered the ice on Sept. 22, 1893, in $78^{\circ} 50'$ N. Lat., $133^{\circ} 37'$ E. Long., and its position at the end of this period was $83^{\circ} 59'$ N. Lat., $102^{\circ} 27'$ E. Long. At times the drift was interrupted and occasionally reversed, the ice moving southerly, particularly in the summer months. The drift averaged less than a mile a day. The highest point attained was $84^{\circ} 04'$ N. Lat. As the mean direction of the drift was carrying the *Fram* towards Spitzbergen rather than towards the Pole, Dr. Nansen decided to leave his ship in command of Capt. Sverdrup, and, with Lieut. Johannsen and dog teams, to advance as far north as possible by sledge.

Period 3. Dr. Nansen's Sledge Journey to his Highest North (March 14 to April 7, 1895).—Dr. Nansen left the *Fram* with Lieut. Johannsen, 28 dogs, 3 sledges and 2 kajaks or skin canoes, and in 17 days reached $86^{\circ} 14'$ N. Lat., the highest point he attained. This is $2^{\circ} 50'$, or 170 geographical miles, further north than Lockwood's highest point, reached in May, 1882, in $44^{\circ} 5'$ W. Long. When he stopped he was within 261 statute miles of the North Pole (the distance between New York City and the southern part of the White Mountains). The southern ice drift and rough ice greatly impeded his advance. The longitude of the sledge journey has not been indicated, but it is about 90° E.

Period 4. The Journey Southwest to Franz Josef Land (April 8

to Aug. 26, 1895).—Four months and a half of sledging, rendered very difficult by cracks and soft snow, before Dr. Nansen made his second landing on the coast of Franz Josef Land, at the point where he spent the winter in $81^{\circ} 13' \text{ N. Lat.}, 56^{\circ} \text{ E. Long.}$

Period 5. The Winter in Camp (Aug. 26, 1895, to May 19, 1896).—Dr. Nansen and Lieut. Johannsen built, at a place where sea game was easily procured, a stone-walled hut with roof of walrus hide, the whole covered deep under snow. Here they lived ten months on bear and walrus meat, making new clothing from blankets and sleeping bags from bear skins.

Period 6. The Journey South and the Meeting with the Jackson Polar Expedition (May 19 to July 18, 1896).—Hoping to reach Spitzbergen, Dr. Nansen and his comrade set out to the south and southwest, following open water much of the time till they met, off Cape Flora, the Jackson expedition which had spent two years in Franz Josef Land. The two explorers left Franz Josef Land on the Jackson supply steamer *Windward* on Aug. 7, and arrived at Vardö on Aug. 13, 1896.

Period 7. Continued Drift of the *Fram* from the time that Dr. Nansen left her until she reached the open sea (March 14, 1895, to Aug. 13, 1896).—At first the *Fram*, with Captain Sverdrup and nine men, drifted westward, but, in the summer, adverse winds sent the ice back and it was not till October that the favorable drift recommenced. During the winter and especially in January and the first part of February, 1896, the drift towards Spitzbergen was comparatively rapid. On Oct. 16, 1895, the *Fram* reached the highest latitude she observed ($85^{\circ} 57' \text{ N. Lat.}, 66^{\circ} \text{ E. Long.}$) within 17 geographical miles of Nansen's farthest. From this point her drift was mainly southwest towards Spitzbergen. On July 19, 1896, while still 150 miles north of the open sea, Capt. Sverdrup began to force his way through the ice, breaking a channel foot by foot by steam and warping and blasting the ice where it could not otherwise be loosened. On Aug. 13, the day that Dr. Nansen arrived at Vardö, the *Fram* reached open water to the north of Spitzbergen, in $81^{\circ} 32' \text{ N. Lat.}, 11^{\circ} 40' \text{ E. Long.}$ She arrived at Norway on Aug. 20, just a week after the arrival of Nansen.

The scientific results of this remarkable expedition, as far as they have yet been made known, may be thus summarized:

Geography.—Several new islands discovered off the Taimyr peninsula, and a new island in the north part of the Kara Sea; very shallow water off the mouth of the Olenek River; determination of the non-existence of any large body of land in an area of about 50,000

square miles in the western part of the Asian Arctic ocean, supplementing the similar discovery by De Long relative to the eastern part of this ocean; evidence that Sannikof Land, of which only a small segment of the southeast coast was known, is only a small island and thus defining, within narrow limits and in connection with De Long's work, the extent of the new Siberian Archipelago; evidence, in connection with Jackson's work, that Franz Josef Land contains no extensive land mass, but consists of small ice-capped islands, which do not extend much, if any, north of the 82d parallel. This discovery leaves the archipelago or land on the Greenland side, traced along its northwest side by Lockwood and Brainard in 1882, and visited on its southern side by Peary in 1892 and 1895, extending further towards the North Pole than any other land yet discovered.

Geology.—"Found moraines and erratic blocks with striæ under the water. Great disintegration appears to have removed them from above the water. These marks indicate that Siberia has been ice-capped, which is opposed to former doctrine."—PROFESSOR MOHN. These discoveries, however, bear out the observations made by Baron Toll, the Russian, along a part of the Siberian Coast in 1893.

Marine Hydrology.—The unusual Arctic Ocean depths previously recorded to the west and southwest of Spitzbergen are found to extend continuously north of that Archipelago, also north of Franz Josef Land, and between that island group and the New Siberian islands to the north of the 79th parallel. South of that parallel, the depth was only up to 90 fathoms. The deepest sounding was 1,942 fathoms (over two miles). Captain Sverdrup writes: "The depth of the sea during our drift was about the same we had found before Nansen's departure, viz., 1,800 to 1,900 fathoms." The most extensive deep known in Arctic waters is thus revealed, and its close proximity to the North Pole largely decreases the probability that there is any very extensive land mass in that neighborhood. "The temperature of the water is from freezing point to $-1\frac{1}{2}$ degrees (Celsius) at the surface and to a depth of 100 fathoms. Under this layer the water is above the freezing point to $+ \frac{1}{2}$ degree to the bottom."—PROFESSOR MOHN.

Professor Mohn in his condensed summary of results, as given to him by Nansen, says: "The current flowed precisely as assumed by Nansen, strongest to the north and northwest in winter and in a contrary direction in summer." This may be assuming too much. Dr. Nansen's theory as to marine currents in the Arctic

waters he visited appears not to have been disproved by his experience, but neither has it been substantiated by any facts yet announced. The ice drift was with the prevailing winds. In a letter from Lieut. Johannsen (*London Daily News*, Sept. 8), he says: "One cannot affirm that there is any regular Polar current running below the ice. . . . But it is a fact that the Polar winds have a certain constancy; the ruling direction is northwest, and these Polar trade winds, as they might be called, set in motion the immense ice masses from East Siberia towards Greenland." Captain Sverdrup, in his statement of the *Fram's* drift north of Spitzbergen (*London Daily Chronicle*, Aug. 27), says: "During the summer we had winds from the southwest and west which drifted the *Fram* backwards towards the northeast and east."

The ice was hummocky, alternating with comparatively level floes.

Meteorology.—Daily observations were made with the usual instruments by Lieut. Johannsen, and the temperature and atmospheric pressure were also registered by Richards's apparatus. The lowest temperature was -62° Fahr. and the highest $+37\frac{1}{2}^{\circ}$. After Dr. Nansen started on his sledge journey the temperature was about -40° , with little intermission for three weeks. Blessing made many observations of the aurora, which never appeared to hover low. The simultaneous observations of Nansen, the *Fram*, Jackson and Ekroll will probably prove very valuable. The determinations of relative humidity were successful. The instruments did not rust, a proof of the dryness of the cold air.

Magnetic Observations.—Numerous observations were taken with instruments on Neumayer's system.

Biology.—Organic life was found in the pools on the ice. No animal life was found in the most northern regions, or trace of life in the great oceanic depths. Migratory birds were not seen.

Determining Geographical Coördinates.—The astronomical fixing of localities was made at all seasons with Olsen's universal instrument erected on wooden pillars frozen fast in the ice. The instrument was invaluable in the period of twilight. The chronometers were regularly controlled by observations of the eclipse of Jupiter's moons.

Hygiene.—In sanitary as well as in other respects the *Fram* fulfilled all expectations. The quarters were warm, there was no illness, and plentiful electric light was derived from the windmill and accumulators. Dr. Nansen has new views concerning scurvy.

Methods of Polar Travel.—Dr. Nansen is convinced by his experience in Franz Josef Land that Arctic wintering is facilitated by adopting many of the habits of the Eskimos; also, that “dogs, canoes, sledges, and the greatest possible self-provisioning will allow of journeys towards the Pole being undertaken over the Polar ice.”

The *Fram* was exposed to violent ice pressures, but was superior to every strain. Her sloping sides served the purpose intended, and at times she was lifted out of her ice-bed by the intense pressure.

Searching for Dr. Nansen.—While many are rejoicing over the safe return of Dr. Nansen and the *Fram*, the Norwegian trader Hansen, who was sent out on June 1 to look for traces of Dr. Nansen along the northern coast of Siberia, is still in the field. The Russian Geographical Society instructed Mr. Hansen to travel along the coast east of the Yenisei River to ascertain, if possible, where Dr. Nansen pushed into the ice-pack; to visit Cape Chelyuskin, the most northern point of Asia; and to go to the New Siberian islands to learn if the supply depot established there for Dr. Nansen by Baron Toll had been opened.—(*Petermanns Mittheilungen*, 1896, Part VIII.)

THE NEXT ATTEMPT ON THE NORTH POLE.—Mr. Jackson and his party are now spending their third year in Franz Josef Land. The letters that Mr. Jackson sent to England by the *Windward*, in August, indicate that he expected to complete the mapping of Franz Josef Land this fall, and in the spring to push north as far as possible by boat or sledge. “I look upon Queen Victoria Sea,” he wrote, “as my most favourable route northward next year. When the sun returns next spring the mapping of Franz Josef Land will be practically complete, and nothing should prevent my attempting the open water or the crust of ice of this sea.” Mr. Harmsworth, who fitted out and is supporting the Jackson Expedition, says that Mr. Jackson will strain every nerve, next spring, to beat Nansen’s record. The *Windward* took to him last summer an entirely fresh equipment of sledges, reindeer, portable boats, tents, and food sufficient for several years, and his right-hand man, Lieut. Armitage. Dr. Kettlits and Mr. Hayward remain with him, though they were at liberty, by the terms of their agreement, to return home in August last. By his journeys in 1895–96 Mr. Jackson has shown that the lands seen by Mr. Payer in the Austrian Expedition of 1873–74 were not the coasts of large land masses, as he inferred, but were

comparatively small islands. Payer's Zichy Land and Wilczek Land, in fact, do not exist. Mr. Jackson has found that Franz Josef Land consists of small islands; and where Payer placed great land masses on his map Mr. Jackson has found a large sea which he has named Queen Victoria Sea. He has taken over 1,000 photographs, made large collections and some discoveries in natural history, particularly in botany.

MR. ANDREE RETURNS HOME.—Mr. S. A. Andree found the conditions unfavorable for starting on his Arctic balloon journey from Danes Island, Spitzbergen, last summer, and has returned to Norway. He expects to make another attempt next year.

MR. PEARY'S RETURN FROM GREENLAND.—The steamer *Hope* arrived at Sydney, Cape Breton, on Sept. 26, with the personnel and collections of the last Greenland expedition of R. E. Peary, C.E., U.S.N. This is Mr. Peary's fourth visit to Greenland, and the sixth expedition (1891-96) under his direct command or auxiliary to his work, that has gone to Greenland fully equipped for exploratory or scientific research. During the past season Mr. Peary pushed north nearly to Cape Sabine ($78^{\circ} 50' N.$ lat.), but was prevented by heavy ice from reaching the cape. Mr. Peary found that last winter was exceptionally severe in Greenland. The east coasts of the American mainland and the islands north of it were blocked by a wide barrier of ice from Turnavik Island, Labrador, to Cape Sabine till late in August. The past summer was marked by much wind and unusually heavy ice, particularly along the west side of Davis Strait and Baffin Bay. On the way north Mr. Peary landed Mr. George Bartlett and his party in the Waigat to collect fossils; Prof. Burton, of Boston, and his party in Umanak Fiord; and Prof. Tarr, of Cornell University, and his party at Wilcox Head, Melville Bay. Before Mr. Peary picked them up on his return these parties were able to devote five or six weeks to geological and glacial studies and natural history collections. Several tons of fossils were gathered. Melville Bay was crossed, in spite of ice and fog, in twenty-six hours, and the *Hope* reached Cape York on Aug. 8, where it was learned that an epidemic of influenza had killed twenty-eight of the Arctic Highlanders, eleven per cent. of their entire number. Anniversary Lodge in Bowdoin Bay, Inglefield Gulf, Mr. Peary's second home in North Greenland, had been burned by the carelessness of a native. The *Hope* touched at various settlements along the coast,

making large ethnological collections. Many specimens of walrus, reindeer, narwhal, white whales, seals, etc., and a series of Arctic birds in all stages of growth were obtained. On the return to Cape York an attempt was made to secure the large meteorite east of that point, but the hoisting machinery was disabled in the difficult work, and before the stone could be hoisted aboard the *Hope* was compelled by the ice to retreat on Sept. 3. The stone has been removed to the water's edge, where it may be secured for the American Museum of Natural History at the next favourable opportunity.

Mr. Peary returned with two live polar bears and a hundred cases of collections for the Museum. In a despatch to the New York *Sun*, Mr. Peary expresses the opinion that the work of Nansen and Jackson has eliminated the Siberian Arctic segment and Franz Josef Land as possible polar routes. There remains the Greenland route as the only land base for further attack on the polar problem. Mr. Peary says the land mass north of Greenland, whose south side he saw in 1892 and 1895, and whose north-west coast was traced by Lockwood in 1882, certainly extends to 84° or 85° , and probably beyond, and this most northerly land known would serve as the point of departure. He adds:

"With an ample supply of provisions a ship might be advanced as far north as Sherard Osborn Fiord. There is as good a chance to force a ship through to that fiord as to Discovery Harbor, where Nares's ship spent the winter of 1875-76. A party composed of two white men and my faithful, hardy, loyal, Eskimo friends from Whale Sound could, by the close of the season in which the ship reached the fiord, have the shores of that archipelago largely determined, and make a supply depot as far north as 85° or 86° from which to start across the ice northward or follow the islands, as the case might be, in the spring. The relief ship need only come to Whale Sound, for the retreat across the ice-cap from the head of Sherard Osborn Fiord with light sledges could be accomplished in two weeks or less."

PEARY LAND.—With the approval and by the desire of geographers in America and Europe, the extreme northern part of Greenland, made known to the world by Mr. Peary's remarkable sledge journey of 1892 on the inland ice, has been named Peary Land. The suggestion was made by the Geographical Club of Philadelphia, and has been seconded by Arctic authorities generally and by *Petermanns Mittheilungen*. His journeys to this region in 1892 and 1896 have hardly been equalled as feats of Arctic sledging. His itineraries covered a distance of about 2,700 miles on the ice-cap at heights of from 3,000 to 8,000 feet above sea level.

NORTH AMERICA.

†THE HYDROLOGY OF THE MISSISSIPPI.—James L. Greenleaf, C.E., in an article on "The Hydrology of the Mississippi" (*American Journal of Science*, July, 1896), says it is fortunate for the dwellers in the Mississippi Valley that the tributary streams differ very widely in their times of flood. If their period of high water occurred simultaneously, the main river would have to carry over 3,000,000 cubic feet of water per second to the Gulf of Mexico. It is rare, however, for more than two large tributaries to reach their highest flood period at the same time. The largest flood from the Ohio, for instance, disappears before that from the Missouri reaches the Mississippi, and through this fortunate circumstance the aggregate in the main river is kept down, so that 1,800,000 cubic feet per second may be regarded as a large flood discharge from the Mississippi. The lower river usually reaches its maximum volume in April or May and its lowest stage in October or November.

BURIED TIMBER IN GLACIAL LAKE BEACHES.—Mr. Ossian Guthrie, who has given much time to researches on the glacial drift of Chicago and the southern shores of Lake Michigan, reports (*The American Geologist*, April and June, 1896) the discovery of three oak logs buried in the beach gravel in that city. One of them, found eleven feet below the surface, was two feet in diameter, and was traced a distance of fifty feet. The second was eight feet below the surface, and fragments of elm, willow, butternut and black walnut were found in the same beach deposit. The third log was found in North Chicago, ten miles from the others, fifteen feet above the present lake, and covered by forty feet of fine clay silt, which protected it so that its wood differs from a modern log chiefly in its blackened color. Its age is estimated at 7,000 years, more or less, equal to the length of the Postglacial or Recent Period.

POPULATION OF MEXICO.—The Annual of the Bureau of Statistics of the Republic of Mexico publishes the results of the last census of the Republic, recently completed. The total population is 12,144,562. The City of Mexico has 326,913 inhabitants; Guadalajara, 95,000; Puebla, 91,275; San Luis Potosi, 63,573; Guanajuato, 52,112; Leon, 47,739; Monterey, 42,529; Pachuca, 39,849; Zacatecas, 38,000. Fourteen other cities have over 20,000 inhabitants each, 38 over 10,000 and 118 over 5,000.

SOUTH AMERICA.

COUNT BAULX IN PATAGONIA.—Count Henry de la Baulx, who has been sent by the French Government to Patagonia and Tierra del Fuego for anthropological and ethnological researches, reached Carmen de Patagones on the Atlantic coast in March last and began his ascent of the Rio Negro. He will follow this river and its tributary, the Limay, to the Cordilleras, will then travel south to the head waters of the Rio Chubut, and will descend it to the sea, at Rawson. He expects to be gone on this journey until May or June of next year, and besides his studies among the natives he hopes to collect much material for the better mapping of the hydrology of southern Patagonia. An excellent outfit of instruments was supplied to him. After his return from this journey he will go to Buenos Ayres to outfit for his work in Tierra del Fuego.

ATTACK UPON DR. HERMANN MEYER IN BRAZIL.—Dr. Hermann Meyer, of Leipzig, who, with Dr. Ranke, of Munich, went to South America to study some of the still unknown tribes of Central Brazil, met with a reverse on the threshold of his work. Before starting for the far interior, however, he went inland from Laguna to the mountain range of the Serra Geral, where he met the almost unknown tribe of the Bugres Indians in the forest of the upper Tubarão River. They gave his party a most inhospitable reception, falling upon his camp one night with a shower of arrows, and compelling him to retreat, fortunately without any loss. The expedition returned to Laguna, and has since pushed into Matto Grosso, where Meyer expected chiefly to work, by way of the Paraná and Paraguay rivers (*Deutsche Rundschau*, 1896, No. 9).

BRAZIL STILL HOLDS TRINIDAD.—As the result of the strenuous protest of Brazil, Great Britain has relinquished her claim upon the small island of Trinidad, which she undertook to appropriate in 1895 as a cable station. Great Britain has acknowledged the sovereignty of Brazil over this island, which is in the Atlantic, a little over 600 geographical miles from the Brazilian coast, below 20 degrees south latitude.

STRUGGLE OF THE ONA INDIANS FOR FOOD.—The commission sent by the Chilean Government to report upon the condition and prospects of its possessions in Tierra del Fuego has reported that the main food resource of the nomadic Onas, who live in the northern half of the main island, is disappearing. In the Chilean territory the Onas subsisted almost wholly upon a small rodent, the

cururo, which breeds rapidly, and was found in large numbers on the plains. It does not thrive in wooded regions. These plains have been appropriated by the sheep farmers, and it is a peculiarity of the cururo that it disappears entirely from the districts where sheep are introduced. The result is that the Onas, deprived of their usual means of existence, have been hunting sheep instead of cururos. They like mutton even better than cururo flesh, and have quickly learned to value the sheep pelt; but the farmers and the natives have become enemies in consequence, and the government is engaged upon the problem of adjusting the grievances of both parties.

SHORTENING THE JOURNEY FROM BOGOTÁ TO THE UNITED STATES.—In order to reach Atlantic steamers bound for this country or Europe, the citizens of Bogotá, capital of Colombia, have been accustomed to go by rail southwest to Ibagué, then north by the Magdalena River steamers to Santa Marlá near the Caribbean Sea, then east by coast steamers to Trinidad. All freight, also, has been forwarded or received by this very circuitous route. The Meta River, east of Bogotá and a tributary of the Orinoco, is nearer the capital than the Magdalena, and a Frenchman, Joseph Bonnet, living in Colombia, has long agitated in favor of utilizing the Meta as a more direct route to Trinidad, making use of the Macareo arm of the Orinoco delta which reaches the sea just south of the island. Mr. Bonnet built a small steamer in Trinidad of about four feet draught which, starting from Port of Spain, ascended the Orinoco and the Meta to Cabuyaro within about 110 miles of Bogotá. The two towns are to be connected by rail with the coöperation of the Colombian Government.—(*Globus*, Vol. LXX, No. 1.)

ASIA.

A RAILROAD FROM MERV TO KUSHK.—The Russian Government has decided to build a railroad from Merv to Kushk, a Russian military post only six miles from the Afghan border at Karatepe and ninety miles north of Herat. The line, passing through the Murghab and Kushk River valleys, will be 225 miles in length and is to be completed in two years. The road will be of military importance and will probably promote trade between Russia and Afghanistan to some extent. According to the understanding between Russia and Great Britain an extension of the line into Afghanistan would be regarded by the latter power as a breach of friendly relations.

A BRANCH OF THE TRANS-CASPIAN R.R.—Russia has decided to build a branch of the Trans-Caspian R.R. along the left bank of the Oxus, from Charjui where the railroad crosses the river into Bokhara, to Kerki, about 140 miles.

THE MEKONG RIVER—Lieutenant Simon, leader of the Hydrographic Commission of the Mekong, who achieved in August, last year, the almost acrobatic feat of forcing the little gun-boat *La Grandière* through sixty-eight rapids in that river between Vientian and Luang-Prabang, is unable to give a very encouraging view of the prospects of utilizing the river for commerce throughout the 1,200 miles between Luang-Prabang and the sea. At low water, navigation is impossible. At medium height, navigation in the cataract regions begins, but is very difficult. At high water (from 25 to 35 feet above mean level), Luang-Prabang may be reached without serious difficulty. About three months in the year the river may be navigated between Vientian and Luang-Prabang.—(*Revue Française*, May, 1896.)

A MAMMOTH SKELETON.—The finding of a mammoth skeleton near Tomsk gives additional proof that man was contemporaneous with this animal in northern Europe and Asia. The bones were found at a depth of about eight feet, some of them lying on a fireplace amid prehistoric stone implements. Three bones, believed to be human, were found with the other remains.—(*Globus*, Vol. LXX, No. 3.)

LAKES EXPLORED IN CELEBES.—The brothers Sarasin have crossed the southeast arm of Celebes and found the two large mountain lakes, Matanna and Towuti, hitherto known only by hearsay. The first is twelve geographical miles long by three wide and a sounding to a depth of 1,575 feet did not reach bottom. The remains of an ancient lake village were found on the south shore and pottery and bronze articles obtained from the natives are similar to relics of the European Lake Dwellers. Lake Matanna is about 1,300 and Towuti 1,150 feet above the level, about 35 miles long and quite wide at its northern end. They occupy an S-shaped valley between mountain ranges.—(*Verhandlungen* of the Berlin Geographical Society, 1896, p. 266.)

AFRICA.

ZONES OF ALTITUDE IN MID-AFRICA.—In his recent book "A Naturalist in Mid-Africa," Mr. G. F. Scott-Elliot distinguishes four zones of altitude in Central Africa: (1) the cocoanut or oil

palm zone, below 3,000 feet; (2) the coffee zone, from 3,000 to 5,000 feet; (3) the zone adapted for white colonization, 5,000 to 7,000 feet; (4) the cloud belt, about 7,000 feet. He gives the height of Mount Ruwenzori at 16,700 feet. The upper limit of forest on its slopes is 9,000 feet, of bamboos 11,000 feet, and of heather 15,500 feet, at which elevation snow begins.

MARINE TYPES IN LAKE TANGANYIKA.—Mr. R. T. Gunther discusses in the *Quarterly Journal of Microscopical Science* the occurrence of such marine forms as the jelly-fish in the fresh waters of Lake Tanganyika, where also several genera of molluscs are found of an unmistakably marine type. He suggests that these marine forms may have been introduced at a time when the lake region was many hundreds of feet lower than at present and the Atlantic extended over the Congo basin of to-day with a fiord-like arm occupying the present place of Tanganyika. This view that Tanganyika is an old arm of the sea is controverted by the Belgian geologist, M. Jules Cornet (*Le Mouvement Géographique*, 1896, Nos. 25-26), who believes that the present character of the shells is the result of adaptation to environment. So large a lake reproduces, in some respects, the conditions of life prevailing in the ocean as, for instance, in the results of severe storms which would shatter delicate shells. He points out also that the medusæ, a specimen of which from Tanganyika was described by Mr. Gunther, are found in other waters that have had no communication with the sea, as, for instance, at Bámako on the Upper Niger. The fact that no deposits showing traces of marine organism have been found in Central Africa he regards as strong evidence against the theory of the marine origin of the lake. He argues that the formation of the lake was due, more probably, to the earth movements which Prof. Suess shows opened the great East Africa rift of which the bed of Tanganyika forms a part.

THE FRENCH PROTECTORATE OF FUTA-DJALLON.—This large and fertile region of West Africa, within which some of the most important rivers of the Sudan, the Niger, Senegal, Scarcies and Tan-kisso take their rise, has never been effectively occupied by France, though Dr. Bayol and the Almamy signed the treaty declaring the protectorate in 1881. Since then France's other interests in the Sudan have diverted attention from Futa-Djallon. An administration has now been organized with M. de Beeckmann at its head, supported by Captain Aumar and his tirailleurs. They were received at the capital, Timbo, on March 18 last, by Almamy Bokar-

Biro, who made proclamation of the protectorate and of his fealty to France.

THE SAND DUNES OF THE SAHARA.—For several years the French have been experimenting successfully at Ain-Sefra with a view to fixing the sand dunes on the borders of the Sahara. M. Paul Privat-Deschanel says in the *Revue Scientifique* that a considerable number of plants were found to derive sufficient nourishment from the sand to keep them alive if protected at first so that they might establish themselves before the sand overwhelmed them or left their roots bare. The plan was hit upon of covering large areas with a litter of alfa grass, and in two years 120 acres were reclaimed. The plants that flourish best on the sand thus reclaimed are the Barbary fig, aspen and peach, which thrive better than the tamarisk or acacia, suggested by the Forestry Department.—(*The Geographical Journal*, 1896, September.)

BUSUMAKWE LAKE.—Two days' journey southeast of Kumassi, the capital of Ashanti, is Lake Busumakwe, which has long been indicated on the maps under the name Bosonotshe but which was first studied, last spring, by Major Donovan, who spent three days among the very numerous and hospitable people dwelling around its shores. He says the lake is about nine miles long, over six miles wide, and is surrounded by many villages of fishermen. A peculiar feature are the numerous dead tree-trunks standing erect in the lake.—(*Globus*, Vol. LXX, No. 1.)

THE HAUSA STATES.—One of the most important African books of this year is "Hausaland," by the Rev. Charles H. Robinson, who has devoted three years to the work of the Hausa Association, and has recently returned from the Hausa territories through which he travelled 1,500 miles. The Hausa Association was organized in Great Britain to study the Hausa language, which is spoken by 15,000,000 people, and the means of introducing Christianity and civilization into these states in the Central Sudan, covering an area of about 500,000 square miles. These states extend from the middle Niger River to Bornu west and east, and from the Sahara to the Benue River north and south. Mr. Robinson entered this region at Loko on the Benue, travelled north to Kano and then southwest to the Niger. Every ten or twelve miles, as a rule, he passed two or more villages of considerable size, and about every fifty miles came to a town containing from 10,000 to 30,000 people. Sokoto, the political capital, is peopled largely by Fulahs instead of Hausas.

Kano is by far the most important town, and its cloth, woven from native-grown cotton, is found all over North Africa from Alexandria to Lagos. More than 25,000 people attend its market daily, and traders from most parts of Africa, north of the Equator and west of the Nile, meet here. The Hausa native is perfectly black, but differs from the ordinary negro, his lips, for instance, being less thick and his hair less kinky. He is industrious, a natural trader, and also a fearless soldier. The governor of the Gold Coast says the only difficulty in battle is to restrain the Hausa soldiers. No part of the Hausa territory is 4,000 feet above the sea, and the region can probably never be colonized by the Caucasian race; but it is now within the British sphere in Africa, and Mr. Robinson says it can be governed and exploited with mutual advantage to Great Britain and the natives. The first great needs are a better monetary currency to supplant cowrie shells, about 100 pounds of which are worth only \$2.50; better transport facilities, which a railroad alone can supply; and the suppression of the slave trade and slave raiding, the great evil of the country, one Hausa chief often making war upon another to enslave persons of his own tribe and race.

EDUCATIONAL.

DETAILED TOPOGRAPHICAL MAPS IN GRAMMAR AND HIGH SCHOOLS.—Prof. Wm. M. Davis, Professor of Physical Geography in Harvard University, has written two pamphlets on the use of the State maps of Connecticut and Rhode Island, respectively, as an aid to the study of geography in grammar and high schools. The pamphlets have been published by the State Boards of Education of those States. Prof. Davis explains the meaning of the color scheme and contour lines; shows how the use of the map in schools may promote a clear perception of the fundamental facts of earth forces in their relation to Man, their influence upon human conditions and activities; shows how these facts of earth form may be learned by direct observation in the home district, and by the study of pictures, maps and verbal descriptions; gives suggestions for the use of the maps in the study of home geography; defines the geographical features to be observed in field study, such as mountains, uplands, ridges, hills, valleys, lowlands, drumlins, gravel hills, plains, terraces, flood plains, marshes and meadows, tidal marshes, forms of water and coast features; illustrates these forms by examples from these States and elsewhere; indicates the importance of leading the student to perceive the various influences these surface features have had upon settlement, occupations, etc.; suggests

a scheme for the distribution of the work through the school course and concludes with remarks on the preparation of the teacher. While these publications are specially designed for use in the schools of Connecticut and Rhode Island, they will be valuable aids in the teaching of geography generally. No teacher in our common schools can give careful study to one of them without having his views enlarged as to the real scope and usefulness to which the teaching of geography may attain in our educational system. If scholars, also, are taught how to handle and understand the excellent maps provided by our Geological Survey, it will go far towards creating a larger demand for a higher grade of cartographic products from map publishers in general.

GEOGRAPHICAL TEACHING IN GREAT BRITAIN.—The Geographical Association in Great Britain has issued a memorandum to the various Boards of School Examiners, with a view to promote a more scientific system of instruction. Examiners are urged to recommend courses of instruction in accordance with the ideas that "the main principles of Physical Geography should form the basis of geographical teaching at all stages," and that in the secondary schools "a general knowledge of geography, based on physical principles, should be required, together with a special study of some selected region, *e. g.*, India, a group of British Colonies, South America, Central Europe."

GEOGRAPHICAL METHODS.—Professor Ludwig Neumann has written a paper (*Geographische Zeitschrift*, 1896, No. 1) in which he surveys German literature on the methods of teaching Geography, presenting a compendium of valuable ideas which the reader could gather from the literature itself only by very large expenditure of time. He insists upon the importance of the teaching of geography by experts, and says it is most absurd to entrust the work of the class-room to a teacher who "has not had a book of geography in his hand for eight or ten years, and has no idea of its scope, methods or teaching material."

GENERAL.

THE CORAL ISLAND EXPEDITION.—The formation of coral atolls and reefs is one of the great disputed problems and the controversy over it has been almost fierce at times, particularly since the accuracy of Mr. Darwin's famous theory has come to be strongly contested. The great difficulty is that while a geologist may wander over a mountain and solve the secret of its existence, he has not

been able to study sub-aqueous mountains in any satisfactory way. When Mr. Darwin wrote to Alexander Agassiz on May 5, 1881, concerning the divergent views of coral formation held by himself and Dr. John Murray, he said: "I wish that some doubly rich millionaire would take it into his head to have borings made in some of the Pacific and Indian atolls and bring home cores for slicing from a depth of 500 to 600 feet." The *London Times* says that this is exactly what is now being done, and that an expedition is at work on a coral atoll in the Pacific. The British Association, the Royal Society and the Government of New South Wales are co-operating in the matter. The leader of the expedition is Mr. W. J. Sollas, Professor of Geology and Mineralogy in the University of Dublin. The scene of work is in Funafuti, in the Ellice group, and the largest isle of the atoll of that name. It was selected as a typical atoll. It is about four miles long by a half-mile wide, and is nowhere higher than eight or nine feet. Thither the expedition, with the boring plant from Sydney, was conveyed by the British naval vessel *Penguin*. Prof. Sollas's instructions are simply "to investigate a coral reef by sounding and boring," and he is expected to carry to his work a mind wholly unbiased by the various rival theories of coral reef formation. The chief problem is to ascertain upon what substances coral reefs are formed, and though the coral polyp does not usually live at a greater depth than ninety feet and has never been found at a greater depth than 300 feet, Prof. Sollas will go down 1,000 feet if he can do so with the means at his command, and thus settle the question beyond all doubt. He expects not only to bore through the reef and into its foundations, but also to study the life history of the polyp and its interesting product.

THE BUDDHIST SACRED TREE.—The story of the sacred tree that grows in front of the temple in the Tibetan lamasery of Kumbum has been severely shaken by recent investigations. Father Huc told, in his charming book, of this tree whose leaves were miraculously inscribed with figures of Buddha, sacred formulæ or prayers. Later explorers, among whom were Potanine, Grenard and Szechenyi, saw the tree and attempted to explain the mysterious markings on its leaves and bark. M. Potanine thought some insect wrought the tracings. Another explanation was that the markings pertained naturally to the tree, which was very remarkable indeed, inasmuch as whole sentences in the Tibetan language might be read on the leaves. The one thing certain was that the priests sold the leaves at a very high price to the faithful. M. Edouard Blanc, the explorer, who has returned to France, saw the sacred tree while in

Tibet, and asserts that the holy inscriptions are an evident artifice of human hands, and that the imposition has been handed down from one generation to another of the lamas of Kumbum, who number about 2,000. Some of the leaves were submitted, last summer, to Mr. Thistleton-Dyer, of Kew Gardens, London. He says that the tree is an ordinary *syringa villosa*, common in China, and that the markings are impressed on the leaves by moulds, aided probably with heat.

MISCHIEVOUS EARTHQUAKE PROPHECY.—“Professor” Falb, of Vienna, inflicted grievous injury upon Athens in 1894 by predicting that the city would suffer severely from an earthquake on May 5. Nearly every one who could do so fled from the city, and there was indeed great suffering, caused, however, entirely by Falb, for there was no earthquake. *Globus* (Vol. LXX, No. 1) says that another of his mischievous prophecies threw Valparaiso, Chili, into a sad state of terror in March last. He predicted one of his “critical days” for March 29, and for several days preceding all the trains were crowded with fugitives bound for the mountains. The number of fugitives was about 7,000. There was no earthquake nor trouble of any sort except that caused by this irresponsible prophet.

WASHINGTON LETTER.

WASHINGTON, SEPTEMBER 29, 1896.

It is just fifty years since the Board of Regents of the Smithsonian Institution held its first meeting. To what extent has geographical investigation been stimulated by the Institution in that period? A broad view of the question would include consideration of cognate subjects, such as ethnology, anthropology, archæology, geology, magnetism, meteorology; but for the present purpose the term "geography" will be considered in the usual or popular understanding of the word.

James Smithson, an Englishman who died in 1829, bequeathed a large property (over \$700,000) to the United States "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men."

The Institution is not therefore local or even national, but for the benefit of mankind, the United States being merely trustee. The two objects—to increase and diffuse—make no restriction in favor of any country, or kind of knowledge.

The Board of Regents determined that "knowledge can be increased by different methods of facilitating and promoting the discovery of new truths, and can be most efficiently diffused among men by means of the press."

The Act of Congress establishing the Institution required also that there should be a library, a museum, and a gallery of art, with a building on a liberal scale to contain them.

To "increase knowledge," the plan of organization proposed to stimulate men of talent to make original researches, by offering suitable rewards; and to "diffuse knowledge," it proposed to publish a series of reports, and occasionally separate treatises. These purposes have been consistently carried out.

The publications of the Institution consist of

Contributions to Knowledge,
Miscellaneous Collections,
Annual Reports,
Miscellaneous Publications,

the latter consisting for the most part of excerpts from the "Collections" and "Reports."

In the "Plan of Organization" the following objects are named for which appropriations of money or material may be made: Explorations in descriptive natural history, . . . topographical surveys, to collect materials for the formation of a Physical Atlas of the United States, . . . new determination of the weight of the earth, . . . institution of statistical inquiries with references to physical subjects, . . . accurate surveys of places celebrated in American history, . . . explorations and accurate surveys of mounds. And, as a collateral, the formation of a library was contemplated, to consist of a complete collection of the transactions and proceedings of all the learned societies of the world, and of the more important current periodical publications; also, catalogues of memoirs and of books in foreign libraries, so that the Institution would be a centre of bibliographical knowledge on any subject. The opportunity of making its library "a centre of bibliographical knowledge" on any subject was lost, however, when in 1866 it was transferred to the Library of Congress.

The earliest publication of the Institution—"Ancient Monuments of the Mississippi Valley, by E. G. Squier and E. H. Davis"—contains the results of extensive original surveys and explorations, constituting valuable additions to the stock of knowledge on a subject then little understood. The chief features of the work are scientific arrangement, simplicity, directness of statement and legitimate deductions from facts, no attempt at speculation or theory. To this work the subsequent inquiries into the early history of man in the northwest owe their chief impetus. The book is a universal guide and is even now a standard. The numerous cuts illustrating the work having been destroyed by fire in 1865, its republication, repeatedly advised and urged, has never been deemed practicable.

Closely following this first geographical offering, came "Contributions to the physical geography of the United States," by Charles Ellet, Jr., the celebrated engineer of wire bridges over the Niagara and Ohio rivers. The work presents a section from actual surveys, of the descent of the bed of the Ohio River from its source in New York to its mouth on the Mississippi. For this paper there was such urgent demand that it was reprinted and liberally distributed.

In pursuance of a design to construct a Physical Atlas of the United States, the Institution, at an early date (1848), commenced the collection of data concerning the measurements and observations of mountain ranges, canal and railway explorations, etc. But this project seems to have received very cautious encourage-

ment. Prof. George Gibbs, in 1862, strenuously urged the compilation of an Ethnological Atlas; and the same gentleman, a few years later (1865), suggested that the time had arrived when the formation of the Physical Atlas should be commenced on a scale commensurate in magnitude and variety of subject with the scientific progress of America, embracing all the departments of natural, physical and social science capable of being represented in such a form, and extended in its design to the entire continent, since the boundaries of the United States were accidental, and governed by none of the laws which control the operations of nature. He urged that preliminary skeleton maps should be prepared, but not on one scale, for the reason that while one certain part of the continent is comparatively destitute of interest over large tracts of country, others crowd into a small space a great variety, and even confusion, of details. He suggested scales of 1:1,200,000 and 1:600,000 respectively, and, besides these, a map of the entire continent on a large scale, certainly not less than 1:3,000,000, including the Arctic regions and the northern skirt of South America. The published records of the Institution contain no further allusion to the subject.

President Edward Hitchcock, under the auspices of the Institution, was engaged in 1850 in researches on erosions of the surface of the earth, especially by rivers, and also in investigations relative to terraces and ancient sea beaches.

Louis Berlandier, a native of Switzerland—geographer, historian and naturalist—arrived in Mexico in 1826 for the purpose of making researches. He died near Matamoros in 1851. The written results of his labors were deposited in the Smithsonian Institution in 1854, but subsequently withdrawn. The printed catalogue of manuscripts comprises an amount of information of the country west of the Sabine River of great importance. It includes maps of Mexican States projected by Berlandier, maps of journeys, routes, valleys, and topographies of numerous routes; topographical maps of different sections of the country; various routes and maps of ancient Texas, and locations of tribes.

In 1854 the Institution published "Remarks Contributory to the Physical Geography of the North American Continent," by Dr. Julius Fröbel. The author afterwards visited Nicaragua, Santa Fé and Chihuahua as correspondent of the *New York Tribune*, and in 1859 published "Seven Years' Travel in Central America, Northern Mexico and the Far West of the United States."

Dr. J. G. Kohl delivered an address at the Institution in 1856 on The Charts and Maps of America. He explained in a measure the causes of the loss of ancient maps; the use of former maps for completing and testing the accuracy of new ones; the value of maps as historical documents; the use of old maps in respect to boundary questions; and finally, the classes and arrangement of maps. The whole was an argument for a great collection of American maps under the auspices of the Government.

Dr. H. Berendt, a naturalized citizen of the United States, visited Yucatan in 1866, under the patronage of the Institution, in order to obtain a more accurate knowledge of the geography and natural history of that region, and to explore what was still unexplored. He first passed up the Balize River, and thence to the region about Lake Petén, making collections in natural history and prosecuting researches in geography and anthropology. The results of his investigations in part are printed in the Report for 1867.

In 1869 Gen. J. H. Simpson, U. S. A., made an interesting study of the vast geographical field embraced in the march of Vasquez de Coronado, in 1540, in search of the "Seven Cities of Cibola." Gen. Simpson had been officially engaged in the service of the United States in exploring that region. His reconnoissances of a large part of the country traversed by Coronado and his followers gave him an advantage in the discussion of the subject. His report has always been one of the most popular of the many publications of the Institution.

On the invitation of the Superintendent of the Coast Survey, Prof. Alexander Agassiz took passage in the *Hassler* while she was going to her field of duty on the coast of California, *via* the Straits of Magellan, in 1871. At the request of the Board of Regents, Prof. Agassiz gave an account of his expedition at the meeting of January 23, 1873.

In 1877 T. A. McParlin, Surgeon in the U. S. Army, communicated "Notes on New Mexico," but confined chiefly to the climatology of the country. His paper was published in the Report of that year.

In 1878 Dr. L. Kumlein, the naturalist of the Howgate Arctic Expedition, made report of explorations in Greenland. He resided several months at Cumberland Gulf, and sent extensive and valuable ethnological and natural history collections from Arctic America.

In 1890 the Institution published a paper by Col. B. Witskowski

and J. Howard Gore entitled *History of Geodetic Operations in Russia*.

In 1892, W. W. Rockhill made a preliminary report in connection with his expedition to the Chinese Empire, which was partly under the auspices of the Institution. This report was much enlarged and published in 1894 under the title of "*Diary of a Journey through Mongolia and Tibet in 1891 and 1892.*"

In 1894 the Institution published *Geographical Tables*, prepared by Prof. R. S. Woodward, formerly of the Coast Survey, but now of Columbia College. This work is historically related to Dr. Guyot's *Meteorological Tables*, first published in 1852, but it is so entirely changed with respect to material, arrangement and presentation, that it is essentially a new publication. It is a representation of the latest knowledge in its field.

Prof. Baird, formerly Assistant and afterwards Secretary, presented for many years, in the *Annual Reports* (1852-1880), summaries of geographical explorations in all quarters of the globe, under governmental, state, society, or individual auspices. The statements were brief, but carefully prepared. The annual summaries of Prof. Baird were followed from 1882 to 1886 by publications entitled "*Progress of Geography*," prepared by F. M. Green (1882-3-4), J. King Goodrich (1885), and William Libbey, Jr. (1886).

The Institution has reprinted, from time to time, foreign papers of geographical interest. These comprise:

The Figure of the Earth. By M. Merino. 1863.

Geographical Latitude. By W. B. Scaife. 1889.

The Physical Structure of the Earth. By Henry Hennessy. 1890.

Stanley and the Map of Africa. By J. S. Keltie. 1890.

Objects of Antarctic Exploration. By G. S. Griffiths. 1890.

The Mediterranean, physical and historical. By Sir R. L. Playfair. 1890.

The Present Standpoint of Geography. By C. R. Markham, F.R.S. 1893.

The Renewal of Antarctic Exploration. By John Murray. 1893.

The North Polar Basin. By H. Seebohm, F.R.S. 1893.

How Maps Are Made. By W. B. Blaikie. 1893.

Variation of Latitude. By J. K. Rees. 1894.

Antarctica: a Vanished Austral Land. By H. O. Forbes. 1894.

Promotion of Further Discovery in the Arctic and Antarctic Regions. By C. R. Markham, F.R.S. 1894.

Physical Condition of the Ocean. By W. J. L. Wharton, R.N. 1894.

The Development of the Cartography of America up to the year 1570. By Dr. S. Ruge. 1894.

Race and Civilization. By W. M. F. Petrie. 1895.

Oceanography, Bionomics and Agriculture. By W. A. Herdman. 1895.

Compulsory Migration in the Pacific Ocean. By Otto Sittig. 1895.

Old Indian Settlements and Architectural Structures in North Central America. By Carl Sapper. 1895.

The Cliff Villages of the Red Rock Country, Arizona, etc. By J. W. Fewkes. 1895.

The Institution has recently issued a new catalogue of its publications, prepared by William J. Rhees, so long connected with this branch of the service.

GLACIAL LAKE AGASSIZ.—The explorations of Mr. Warren Upham while engaged in the geological and natural history survey of Minnesota (1879–85) showed that a very large lake occupied the Red River Valley in the closing stage of the glacial period.

The highest shore-line of the lake in Minnesota was mapped through its prairie portion, extending about 175 miles from Lake Traverse eastward to Herman, and thence northward to Maple Lake.

As a satisfactory investigation of the extent and history of the extinct lake would comprise both sides of the Red River Valley, the United States Geological Survey undertook the more extended examination of the area, and assigned Mr. Upham to the duty. When the shore-lines had been mapped through North Dakota to the Canadian boundary line, it was arranged with the authorities of the latter country that Mr. Upham's work should be continued through Southwestern Manitoba. Altogether the explorations occupied six years, and the results are embodied in a volume recently published by the United States Geological Survey,* entitled "The Glacial Lake Agassiz."

The situation of this great lake was in the geographic centre of the continent,—about one-fifth lying within the United States. The area covered was approximately from 45° 30' to 55° north latitude, and from 92° 30' on the boundary to 106° west longitude. It was several times larger than Lake Superior; in fact, it exceeded the aggregate area of the five great lakes contributory to the St. Lawrence. Through the earlier part of its duration it outflowed southward to the Mississippi River. Later it outflowed by lower avenues

* Monograph, Vol. XXV.

northeastward. Finally it was reduced to Lakes Winnipeg, Manitoba and Winnipegosis, which are its lineal descendants. It covered at one time portions of Manitoba, Minnesota and North Dakota.

In explanation of the existence of this lake and of its name, Mr. Upham says: "When the Glacial period in North America was ending, as soon as the border of the ice had receded beyond the watershed dividing the basins of the Minnesota and Red rivers, it is evident that a lake, fed by the glacial melting, stood at the foot of the ice-fields, and extended northward as they withdrew along the Red River Valley to Lake Winnipeg, filling this valley to the height of the lowest point over which an outlet could be found. Until the ice barrier was so far melted upon the area between Lake Winnipeg and Hudson Bay that this glacial lake began to be discharged northeastward, its outlet was along the present course of the Minnesota River. Because of its relation to the retreating continental ice-sheet, the lake has been named in memory of Prof. Louis Agassiz, the first prominent advocate of the theory that the drift was produced by land ice."

EXPEDITION TO THE SOUTHERN HEMISPHERE.—We have a reminder of the U. S. Naval Expedition to the Southern Hemisphere in 1849-52, under Capt. J. M. Gilliss, by the recent appearance of "A Catalogue of 16,748 southern stars deduced by the U. S. Naval Observatory from the zone observations made by the U. S. Naval Expedition during 1849-52."

The Narrative of this expedition, excepting Vols. 4 and 5, was published in 1855-56. The material comprised in the "Catalogue" now issued was originally intended to form Vols. 4 and 5, but owing to the insufficient staff of workers and the death of Capt. Gilliss the work was never completed. At the time of his death much had been done, and before the office of the Expedition was closed in 1866, the manuscript of the Observations to be contained in Vol. 4 was ready for the printer, and Vol. 5 was so far advanced that it was supposed it could be finished in about a year. From 1866 to 1894 the papers were in the custody of the Naval Observatory, receiving such attention in the way of computations and reductions as the time at the command of the force would allow. The reductions were finally completed by Professors E. Frisby, U. S. N., and S. J. Brown, U. S. N., and have just been issued as "Appendix i, Washington Observations for 1890." This volume of 486 pages 4to, may therefore be considered the substitute for the 4th and 5th volumes of Gilliss's U. S. Naval Astronomical Expedition.

OCEANIC ICHTHYOLOGY.—The great work by the late Dr. G. Brown Goode and Tarleton H. Bean on the deep-sea and pelagic fishes of the world has been published under the supervision of the Smithsonian Institution. Oceanic ichthyology is concerned with the study of fishes which dwell in the open ocean far from the shore.

The authors do not claim that they have brought forward any conclusions which are new to science, though a great number of new facts are recorded. The information which they have obtained they have endeavored to bring into proper relationship with the mass of similar knowledge already recorded. The work as it now appears was first ready for the press in 1885, then revised and re-written in 1888, then again in 1891, and again in 1894, as it was going through the press. The authors say: "In its present form it stands as a compendium and summary of existing knowledge in regard to Oceanic Ichthyology. No one knows when there will be opportunity for its further study. There are no expeditions and there seems to be no prospect for new ones. Even the *Albatross*, built by the United States expressly for this service, is diverted to police duty about the Seal Islands."

ALASKA BOUNDARY.—The Superintendent of the Coast Survey says that in determining the 141st meridian of longitude the notes of the British surveyor have been compared with those of the American surveyors and have been found to vary so little that no trouble will be found in striking a compromise between the two lines. The maps of the whole survey, that is to say, of the 141st meridian, and of the line of ten marine leagues from the coast, are now in possession of the two Governments, and it is understood that negotiations are about completed looking to the selection of a joint commission to strike the line between the two countries. The Superintendent expresses the belief that the Alaskan gold fields are located on the American side of the 141st meridian.

NICARAGUA.—Mr. Henry E. Low, the Vice-Consul at Managua, has sent to the Department of State a map of Nicaragua, which gives a rough sketch of the existing railroads in the country and the lines which are projected. The thickest parts of Nicaragua lie on the Pacific, and civilization does not reach, on an average, much further inland than about 100 miles from the coast. Beyond this 100-mile belt, the country is not even properly explored.

NOTES.—The U. S. Hydrographic Office has recently issued a new chart—34 x 41 inches—of the Pacific Ocean, compiled from

the latest information; also, of the Atlantic Coast from the Strait of Belle Isle to New York; and of portions of the west coast of North America, that is to say, of the west coast of Lower California, and the west coast of Vancouver Island. The office has also published Sunrise and Sunset Tables, showing the local mean time of the sun's visible rising and setting for each degree of latitude between 60° N. and 60° S., and for each degree of the sun's declination.

Mr. W. J. Hoffman, of the National Museum, has in press an illustrated work on the Graphic Arts of the Eskimos, in which he discusses their geographical distribution, population, early explorations, pre-historic art, art in general, ornamentation and materials employed, pastimes, gesture signs, etc.

The United States Geological Survey is placing iron monuments in Wyoming at each township corner, with bench marks. The posts are iron tubing, $3\frac{1}{2}$ inches in diameter and 4 ft. long. On the top is fastened a brass plate on which is stamped "U. S. Geological Survey, B. M." The elevation, township and range numbers will be stamped on the plate by dies carried by the engineers. In the future, all Government surveys will be marked in this manner in the West. The system will be of immense value to settlers, ranchmen and civil engineers.

H.

BOOK NOTICES.

Report of the Sixth International Geographical Congress, held in London, 1895. With Maps and Illustrations. Edited by the Secretaries. 1896. London: John Murray, Albemarle Street, Berlin: Dietrich Reimer (Hoefer & Vohsen). Paris: Hachette et Cie.

While the two Secretaries hold themselves responsible for this Report, they say in their preface that the editorial work has been done by Dr. Mill. They rightly call attention to the fact that the International Geographical Congress is now a permanent institution, in virtue of the First Resolution adopted :

That the officers of each Congress continue to act until the organization of the following Congress, in order—

- (1) To carry out as far as possible the resolutions of the last Congress;
- (2) To keep up relations with the special committees which may be appointed;
- (3) To communicate with the Organizing Committee of the following Congress regarding all questions pending;
- (4) To present to the following Congress a report on the work done in the interval.

An apology is made for delay in the publication of the volume, which seems, however, to have been produced with all reasonable speed, since it was delivered in New York, well printed and handsomely bound, in less than a year from the opening of the Congress.

The Introductory gives a brief account of previous Congresses, and a diary of the proceedings of the Sixth in London. The papers, printed in English, French, German, or Italian, as originally read, fill 800 pages, and there are two appendices; one of 84 pages, containing the List of Members, the other giving the Catalogue of the Exhibition, in 200 pages.

Some of the more elaborate papers are : Geography in the Schools and in the University, by M. Emile Levasseur; The Training of Instructors in Geography in the University, by Dr. R. Lehmann; On the Importance of Geography in Secondary Education, and the Training of Teachers therein, by Andrew J. Herbertson; On South Polar Exploration, by Dr. G. Neumayer; Arctic Exploration, by Rear-Adm. A. H. Markham, R. N.; Russian Explorations of the Maritime Route to Siberia, by Lieut.-Col. Julius de Shokalsky; The Geodetic Operations of the Indian Survey, by Gen. J

T. Walker, late Surveyor-Gen. of India; The General Levelling of France, by M. Charles Lallemand; A Brief History of the Surveys and of the Cartography of the Colony of the Cape of Good Hope, by A. de Smidt, late Surveyor-Gen. of the Colony; On the Geodetic Survey of South Africa, by Dr. David Gill, H. M. Astronomer at the Cape of Good Hope; A Retrospect of Oceanography during the last twenty years, by J. Y. Buchanan, F.R.S.; On Some Points Connected with the Orthography of Place-Names, by G. G. Chisholm, M.A.; Geographical Place-Names in Europe and the East, by Dr. James Burgess, C. I. E. (this paper gives the principal Indian, the Arabic, Turkish, Persian, Hindustani and Russian alphabets); On the State of Geographical Exploration in the Western Half of New Guinea, by Dr. C. M. Kan; On the Morphology of the Earth's Surface (with a proposed terminology), by Dr. Albrecht Penck.

M. Gobat presented the Report of the Committee appointed by the Fifth International Congress (Berne, 1891) to take measures for giving effect to the resolutions adopted. Of these the more important were : On the Plan of a Map of the World on the scale of 1:1,000,000; on the Choice of an Initial Meridian; on the recommended adoption of the metric system in English scientific and technical publications; on the Orthography of Geographical Names; and On the Creation of Geographical Bibliographies.

Nothing has been done with regard to the choice of a meridian or the adoption of the metric system. In bibliography, Germany, Austria, Hungary and Switzerland have published in whole or in part their contributions, and The Netherlands had anticipated the resolution of the Congress by the publication in 1888 and 1889 of a complete bibliography in three volumes.

Dr. Penck's project for a map of the world on the scale of 1:1,000,000 has not made much progress, but it has attracted a great deal of attention and criticism, and Gen. de Tillo's remarks, printed in the *Discussion* (pp. 382-386), are full of instruction.

The matter of geographical orthography remains where it was. Mr. G. G. Chisholm, in his lucid paper, sketches a plan of operations for the introduction of a consistent scheme. He would have this adopted by Government and other official boards, by leading publishers and by all authors, by missionary societies, Chambers of Commerce, steamship companies, foreign railway companies, etc., and by the daily press. A more ample programme has not been printed since the day of Volapük

Memoirs of the Peabody Museum of American Archaeology and Ethnology, Harvard University. Vol. I.—No. 1, Prehistoric Ruins of Copan, Honduras. A Preliminary Report of the Explorations by the Museum, 1891-1895. 4to. Cambridge, Mass: Published by the Museum, 1896.

The ruins of Copan are in the territory of Honduras, about twelve miles from the frontier of Guatemala, in the valley of the Copan River, and shut in by mountains that rise to a height of 3,000 feet. The valley is at an elevation of 2,000 feet above the sea.

When Stephens visited the ruins in 1839, they were buried in a great forest. To-day the valley is cleared. About thirty years ago, a colony from Guatemala cut down the trees, leaving only a few gigantic cedars and ceibas about the ruins of the temples.

The valley is a mile and a half in width and seven or eight miles in length, and the river Copan winds through it in a south-westerly direction. The principal ruins are on the right bank of the river, near the centre of the valley, and the stream, bending abruptly at this point, flows directly against them. For a long time, according to the *Report*,

it has been making encroachments on the ruins, and the entire eastern side of the great pile known as the Main Structure has been carried away by it, leaving the interior exposed in the form of a cliff one hundred and twenty feet high. The whole of this elevation is artificial; pieces of pottery and obsidian knives can be picked out of it even at the water's edge. The river is subject to annual freshets, during which an immense body of water is thrown with great force directly against the opposing cliff, from whose face a fresh portion falls in each succeeding year. So swift is the current that little of this fallen material is left when the water subsides.

It was time that something should be done.

In 1885 Mr. A. P. Maudslay, an Englishman, mapped the ruins and made careful explorations. He took moulds of the principal monuments and has published the result of his studies in a form which makes it, in the words of the *Report*, at this date the most valuable contribution to the archæology of Central America.

In 1889 Mr. E. W. Perry obtained a concession from the Government of Honduras, for the exploration of the ruins and the formation of a museum at Copan. Mr. Perry in 1891 transferred his rights under the concession to the Peabody Museum, which drew up a plan of operations, and acquired, by an edict of the Honduras Government, the care of the antiquities of the country for a period of ten years, with the right of exploring the ruins and taking away one-half of the objects found in the excavations.

In the period 1891-1895 four expeditions were sent out, the third under Mr. Maudslay, who has done all in his power to further the work of the Museum.

The Report is illustrated by nine plates, the first being a large plan of the ruins, with descriptive text.

The Relations of the Gulf Stream and the Labrador Current. By William Libbey, Jr., D. Sc., Professor of Physical Geography, Princeton, N. J. (With Plates.) Reprinted from the Report of the Sixth International Geographical Congress, held in London, 1895.

The investigation of the relations of the Gulf Stream and the Labrador Current was begun by the U. S. Fish Commission in 1889, with the view of ascertaining whether the changes in the positions of these currents affected the movements of the schools of fish along our eastern coast. The plan adopted by Prof. Libbey was to run out a series of lines at intervals of ten minutes of longitude, extending to the southward from the New England coast, between the island of Nantucket on the east, and Block Island on the west. Upon these lines, at intervals of ten minutes of latitude, stations were located, upon which serial temperature and density observations were made, and simultaneously with these an hourly set of complete meteorological records was maintained.

A study of the temperature profiles obtained in 1891 showed that the lower part of the 50° line (representing the lower portion of the Gulf Stream) touched the edge of the continental platform and raised its temperature ten degrees. This had occurred also in 1890. If it continued in 1892 the conditions for the reappearance of the tile-fish (*Iopholatilus chamaeleonticeps*) would be reestablished. In 1880 and 1881 this fish appeared on the New England coast in considerable numbers; but in the spring of 1882 the water from Cape May to Nantucket was covered with millions of dead and dying tile-fish, and from that time they disappeared.

The fish is probably a deep-sea tropical species and it is supposed to have followed the northward extension of a band of warm water. In 1892 Prof. Libbey found the tile-fish to the southward of Martha's Vineyard and all the way to the Delaware capes, and he explains its disappearance in 1882 by the withdrawal of the band of warm water under the pressure of a cold current. He notes the interesting fact that the dead bodies of the fish came to the surface in that year in a long crescent-like curve, which followed the line of the edge of the continental platform between Cape May and Nantucket.

The paper is illustrated by 21 coloured profiles of the water temperatures.

The Discovery of America by John Cabot in 1497. Being Extracts from the Proceedings of the Royal Society of Canada, relative to a Cabot celebration in 1897, and the Voyages of the Cabots, a paper from the Transactions of the Society in 1896, with Appendices on Kindred Subjects, by Samuel Edward Dawson, Lit. D. (Laval). Ottawa, 1896. For sale by James Hope and Sons.

At the meeting of the Royal Society of Canada, held at Ottawa in May, 1896, it was decided to make arrangements for a meeting at Halifax in 1897, in order to commemorate the discovery of the mainland of America by John Cabot in 1497. A committee was also appointed to obtain designs for a monument, to cost not less than \$1,000, to be erected at Sydney, Cape Breton Island, in honour of the discoverer.

The Society does not commit itself to a theory of Cabot's landfall, but selects Sydney as on the whole the best site for the proposed monument.

Dr. Dawson's paper on the Voyages of the Cabots is a sequel to his paper on the same subject in the *Transactions* of the Royal Society for 1894. In that he argued in favour of Cape Breton as the landfall of Cabot, and he now considers the objections which have been made to his theory, by Mr. Justice Prowse, the historian of Newfoundland, and by Mr. Henry Harrisse.

Judge Prowse believes that the landfall was Cape Bonavista in Newfoundland, and he gives, as quoted by Dr. Dawson, the following reasons: the unbroken tradition in Newfoundland, and the inscription, *A Cabote primum reperta*, opposite to Cape Bonavista in John Mason's map of Newfoundland, about 1616.

Dr. Dawson rightly remarks that a tradition presupposes settlers to hand it down, and that there were no settlers for a hundred years after Cabot.

The legend on Mason's map is not much stronger than the unbroken tradition. No such legend is found in any one of the maps published in the 119 years between the date of the discovery and that of Mason's map.

Mr. Harrisse, in his work on the Cabots, published this year in London, makes the landfall at or near Cape Chidley, in Labrador. He objects to the Cape Breton landfall that in June and July navigation all round Newfoundland and the Gulf of St. Lawrence is impeded by fogs, icebergs and undercurrents, and that, therefore, Cabot could not have reached Cape Breton at the time stated.

Dr. Dawson attributes this astonishing error, as he calls it, to Mr. Harrisse's lack of personal knowledge of the north-eastern coast

of America. The fact is that in the summer a procession of icebergs and field-ice, 1,000 miles long, comes down the Labrador coast, where Mr. Harrissee now places the landfall of Cabot. In 1886, an uncommonly early season, the captain of the *Alert* found far to the south of Cape Chidley, on the 2d of July, heavy field-ice packed tight for 15 miles off shore, with a *bordage* of slack ice, ten miles further out. The land reached by Cabot on the 24th of June is described by him as excellent and the climate temperate, suggesting that brazil-wood and silk grow there.

Mr. Harrissee supposes that Cabot, in following the coast, cast anchor at sundown and sailed again with daylight the next morning; a supposition which Dr. Dawson, who knows the Labrador coast, finds it impossible to admit.

Fish were abundant on the coast discovered by Cabot. The vicinity of Cape Chidley is noted for its amazing quantity of codfish, and this seems to Mr. Harrissee to strengthen the argument in favour of the Labrador landfall.

In answer to this it is shown from Prof. Hind's statement laid before the Fishery Commission at Halifax, that the codfish do not arrive at Cape Chidley until the 15th of August, while it is known that on the 10th of August, 1497, John Cabot was in London, with the news of his discovery.

Dr. Dawson closes his temperate paper with these words:

it is not likely that there will be absolute uniformity of opinion upon this point, any more than there is upon the identity of the island, Guanahani, which was the landfall of the great admiral.

Wherever Cabot first came to land, he virtually discovered North America. Admitting this as an established fact, Dr. Dawson's readers must think it strange that he maintains throughout this later paper the erroneous claim made for Cabot in the paper of 1894, in these words:

Upon that easternmost point (Cape Breton) of this Nova Scotian land of our common country John Cabot planted the banner of St. George on June 24, 1497, more than one year before Columbus set foot upon the main Continent of America . . . what shall Canadians do to commemorate the fourth centenary of that auspicious day when the red cross was planted on the mainland across the western sea . . . ?

Enthusiasm in a good cause is commendable, and Cabot's discovery was an achievement worthy of celebration; but if his landfall was Cape Breton, the red cross was planted, not on the mainland, but on an island. Mr. Harrissee may very well remark, in his turn, that Dr. Dawson does not seem to know the Canadian coast.

Crónica del Undécimo Congreso Internacional de Americanistas, primero reunido en México en Octubre de 1895, escrita por Enrique de Olavarria y Ferrari, México, 1896. Imprenta y Litografía "La Europea" de Camacho, Calle de Santa Isabel núm. 9.

This *Crónica* contains reports of the daily sessions of the Congress of Americanists, with full notices of the receptions, banquets and excursions, offered by the Mexican Government and the citizens of the capital to their guests. Señor Olavarria's style is diffuse and flowing, and he leaves nothing to the imagination of his readers, whether he describes the Valley of Mexico or sets before them the character and career of President Diaz. An interesting chapter is the ninth, on the Excursion to Popotla and the tree of the *Noche Triste*. This gives the detailed story of the fire which broke out in the great tree May 2, 1872, and burned for sixteen hours before it could be extinguished; but the tree was not killed, and now, after twenty-four years, its trunk and single remaining arm are perennially green and full of vigour. It is now protected by an iron grating.

The papers submitted to the Congress are yet to be published.

The Twelfth Congress is to meet at the Hague.

The sixth volume of the Publications of the University of Pennsylvania, Series in Philology, Literature and Art, is now in preparation. This volume contains:

- a. The Antiquity of Man in the Delaware Valley.
- b. Exploration of an Indian Ossuary on the Choptank River, Dorchester Co., Md. (With a description of the Crania discovered by E. D. Cope; and an examination of traces of disease in the bones, by Dr. R. H. Harte.)
- c. Exploration of Aboriginal Shell Heaps on York River, Maine. By Henry C. Mercer, Curator of the Museum of American Archaeology.

These publications are issued through Messrs. Ginn & Co., 9-13 Tremont Place, Boston, Mass., in volumes of 200 or 250 pages, comprising two or more monographs, at \$2 per vol. to subscribers. Each monograph may be obtained separately.

A Naturalist in Mid-Africa, being an Account of a Journey to the Mountains of the Moon and Tanganyika. By G. F. Scott Elliot, M.A., F.L.S., F.R.G.S. London, A. D. Innes & Co., Bedford Street, 1896.

In his preface Mr. Scott Elliot expresses his thanks to the many who have aided him in the preparation of this work by giving shape and form to his MSS. as well as to his illustrations, originally very bad, and by contributions to the scientific matter. His map,

now produced for the first time, corrects some of the inaccuracies retained "in deference to a more recognized authority" in the one constructed from his materials and published in the *Geographical Journal*, Vol. 6, p. 400.

This more recognized authority was Mr. H. M. Stanley, whose necessarily imperfect sketch of the Ruwenzori region was not to be doubted. Mr. Scott Elliot notes some of Stanley's errors:

Mount Gordon Bennett, Mackinnon Peak, and Mount Lamson are not mountains, but quite insignificant hills, if they have any existence at all (*p. 194*).

Stanley's Observation Hill was not noticeable in any way, but it should be on the right-hand bank (*p. 255*).

I spent much time and trouble in trying to discover where on earth the enormous fresh-water sea, discovered and christened the Alexandra Nyanza by Mr. Stanley, could possibly be. This, of course, it is now clear, has no existence whatever; apparently the name is applied to a papyrus fringe on the course of the Kagera proper (*p. 256*).

So much for self-vindication. The author's route was from Mombasa to the northwest, then along the upper shore of the Victoria Nyanza to the country between that and the Albert Edward, thence to the Tanganyika and Lake Nyassa and through Blantyre to Chindi, where he took passage for Zanzibar.

The first stage was across a thorn desert to Nzowi in the well-cultivated Wakamba country, where the climatic conditions begin to be suitable to Europeans, and so continue through the Masai highlands. At Nandi begins the descent to the Victoria Nyanza region, a plateau stretching westward to the base of Ruwenzori and at an elevation of about 4,000 feet.

From the observations Mr. Scott Elliot comes to the conclusion that the Victoria lake must at one time have been a hundred feet above its present level. Then, perhaps by the cutting away of the rock at the Ripon Falls, the lake began to sink, and is still falling. The valleys, even at 200 miles from the Victoria, are filled with the rich alluvium that is common in Lower Egypt. This deposit is often 30 feet deep and would produce, with irrigation, enormous crops of cotton, sugar, rice and wheat. So far as has been ascertained, however, the natural productions of Uganda are not of great value, and the Victoria region is poor in dyes and gums, medicines and fibre plants. Iron is the only known mineral.

The climate of Uganda is not unhealthy and the annual rainfall, from eight years' observations at the Missionary Station of Natete, is 47.61 inches.

On the way to the Ruwenzori Mr. Scott Elliot was taken with fever, and made all haste to ascend the mountain. At the height of

7,000 feet he found a temperature not very different from that of England, and English plants, such as the sanicle, the meadow rue, the forget-me-not and St. Johns wort, flowering in the same month as their cousins in Dumfriesshire. He devotes a chapter to the consideration of some of the problems suggested by the presence of these plants on a ridge of Ruwenzori. At 7,000 feet the forest begins; from 9,000 to 11,000 is the bamboo zone, and above that the heather, in a ground of peat moss covered with sphagnum to a depth of 18 inches. Here the heather develops into trees, nearly two feet in diameter and 80 feet high. The snowline of the mountain is at 15,500 feet.

Geologically, Ruwenzori is supposed to have formed a part of the original Victoria region plateau of underlying gneissose rocks, covered by mica schists, with intrusive dykes of lava. Then an elliptic area, now the central cone of the mountain, was elevated. Mr. Scott Elliot thinks he has seen evidence of glaciation in the typical V-shaped valleys.

The Germans find little favour with Mr. Scott Elliot. He accuses them (p. 26) of shooting the Masai on sight, and making the name of the white man odious (p. 158). He himself entered German territory, giving full information of his movements and doing everything in his power to pay for everything. The result was, in his own words, that

the German Government stole my guns (p. 158).

This looks like small business for a great Government; but there is room for doubt, and the following broad statement, on the same page, seems to show that Mr. Scott Elliot is not always in a judicial frame of mind:

In fact, the courteous manner in which the English Government treats others, and the extreme want of courtesy with which Englishmen are treated by the German and French Governments, is almost beyond belief.

None the less, the Germans, as well as the Belgians, are commended for resolute dealing with the Arabs, whose rule, it is declared, involves the moral, mental and physical ruin of every subject native race.

Mr. Scott Elliot devotes a chapter to the Suahili, the half Mohammedan porters and carriers of East Africa.

They are, he says, pure savages, not to be managed without the whip, children in their want of forethought and in cheerfulness. They are wanting in affection, even for each other, though at times they display attachment to their Arab masters. They have great power of endurance, but they lack courage and they show a great deal of stupidity. It is almost hopeless to attempt to Christianise

them. One old man, to whom a Catholic priest had patiently explained the future state of the unredeemed, made the brief reply: "I am an old man, I like to be near the fire."

The race is dying out, with the suppression of slave raiding.

The appendices give lists of altitudes, scientific collections (the botanical specimens not yet named) and articles of export, present and prospective.

There are 49 good illustrations and four maps.

Il Territorio Contestato tra la Venezuela e la Guiana Inglese. Lettera aperta al chiarissimo Signor Comm. Dott. Clinio Silvestri, Console Generale degli Stati Uniti di Venezuela in Italia, Roma. Direzione ed Amministrazione del "Cosmos di Guido Cora," 74 Corso Vittorio Emanuele. 8vo. Torino, 1896.

In this "Open Letter," Prof. Cora makes reply to a printed remonstrance addressed to him by the Venezuelan Consul-General concerning a map of South America, published by Prof. Cora to show the distribution of the Italians in American countries.

The Consul General finds in this map a very serious error in the eastern boundary of Venezuela, and especially in the territory bounded by the *Sea of the Antilles*, the river Orinoco and the river Essequibo; a region which belongs, as he declares, to Venezuela.

According to Prof. Cora, the school map in question bears the date of 1891, and necessarily gives the limits previous to that date. Had there been a later edition of the map, he says, the Consul-General would have found the Venezuelan area considerably reduced on the west, in accordance with the decision rendered, March 16, 1891, by the Queen of Spain as arbitrator between Venezuela and Colombia.*

It excites Prof. Cora's surprise that he alone should be called upon to correct the boundary assigned by him to Venezuela, when his boundary agrees with that drawn in most of the maps now in existence, including those of greatest authority.

He cites the various editions of Stieler's Hand-Atlas, Kiepert's great map of northern tropical America, 1858, and his Hand-Atlas, Vivien de Saint-Martin and Schrader's Atlas Universel, and the Atlas de Géographie Moderne of Schrader, Prudent and Anthoine; to name only, he says, a few German and French cartographers of the first rank.

He fortifies his position by references to the historical record, and declares that the question between himself and the Consul-General is one of appreciation with regard to a still unsettled controversy.

* This decision was in favour of Colombia, and Venezuela declined to abide by it.

ACCESSIONS TO THE LIBRARY.

JULY-SEPTEMBER, 1896.

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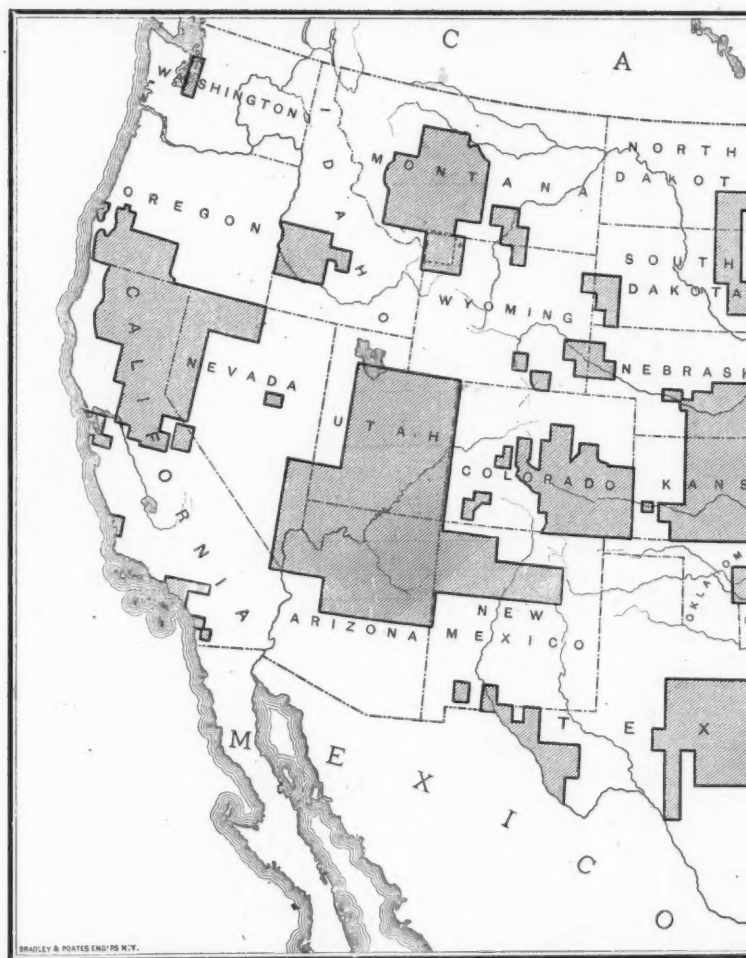
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